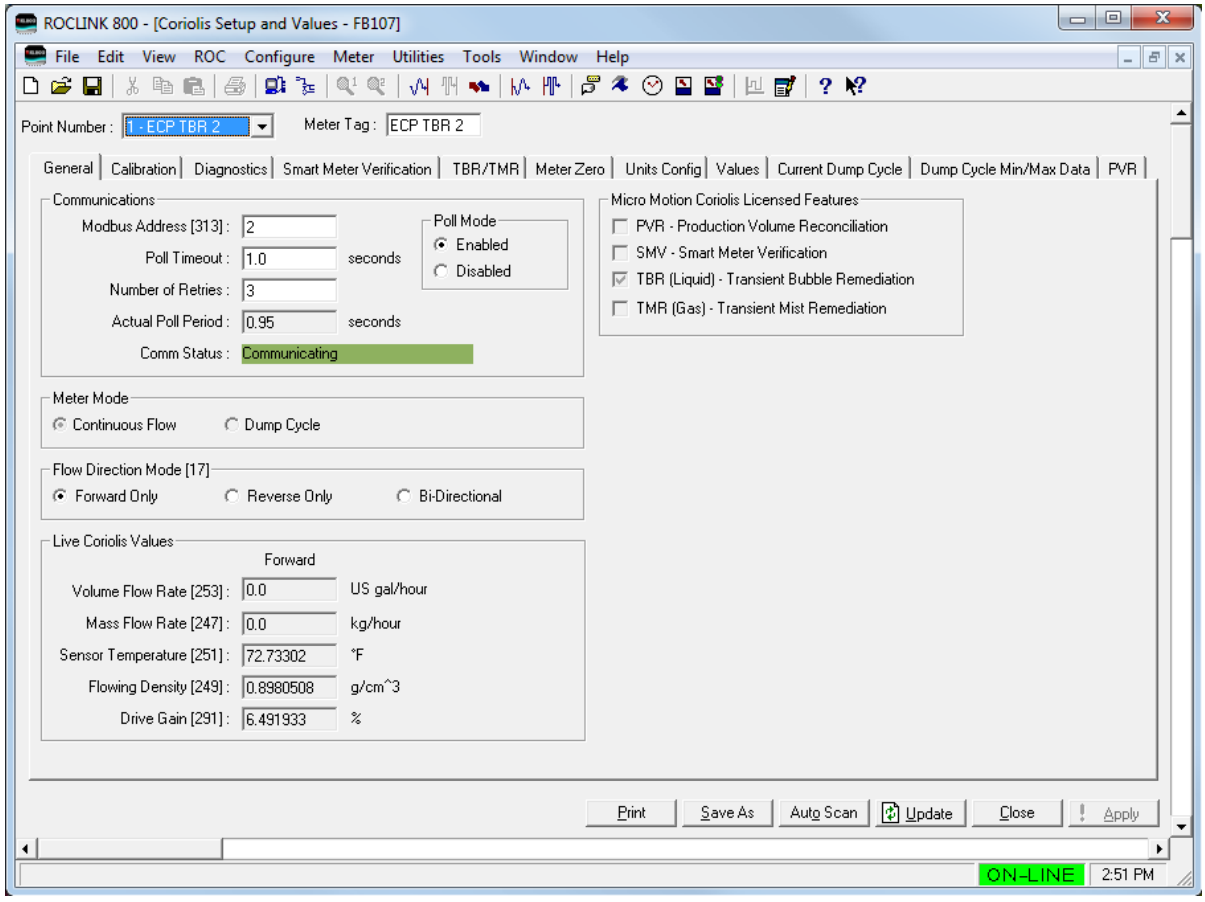
Part D301753X012
August 2015

Micro Motion® Coriolis Interface Module User Manual (for ROC800-Series and FloBoss™ 107 Controllers)


ROCLINK 800 - [Coriolis Setup and Values - FB107]
File Edit View ROC Configure Meter Utilities Tools Window Help
Point Number : 1 - ECP TBR 2
Meter Tag : ECP TBR 2
General Calibration Diagnostics Smart Meter Verification TBR/TMR Meter Zero Units Config Values Current Dump Cycle Dump Cycle Min/Max Data PVR
Communications
Modbus Address [313] : 2
Poll Timeout : 1.0 seconds
Number of Retries : 3
Actual Poll Period : 0.95 seconds
Comm Status : Communicating
Poll Mode
Enabled
Disabled
Micro Motion Coriolis Licensed Features
PVR - Production Volume Reconciliation
SMV - Smart Meter Verification
TBR (Liquid) - Transient Bubble Remediation
TMR (Gas) - Transient Mist Remediation
Meter Mode
Continuous Flow
Dump Cycle
Flow Direction Mode [17]
Forward Only
Reverse Only
Bi-Directional
Live Coriolis Values
Forward
Volume Flow Rate [253] : 0.0 US gal/hour
Mass Flow Rate [247] : 0.0 kg/hour
Sensor Temperature [251] : 72.73302 °F
Flowing Density [249] : 0.8980508 g/cm^3
Drive Gain [291] : 6.491933 %
Print
Save As
Auto Scan
Update
Close
Apply
ON-LINE
2:51 PM

Remote Automation Solutions

EMERSON.
Process Management

Revision Tracking Sheet

August 2015

This manual may be revised periodically to incorporate new or updated information. The revision date of each page appears at the bottom of the page opposite the page number. A change in revision date to any page also changes the date of the manual that appears on the front cover. Listed below is the revision date of each page (if applicable):

Page	Revision
All pages	Aug-2015
All pages	May-2015
Initial release	Feb-2014

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Chapter 1 – Introduction

⚠ Caution When using inputs that are **not** resident in the flow computer or RTU (that is, are provided by a communication mechanism) for control, ensure that a supervisory system or mechanical safety equipment is in place to provide proper function. While communication errors are noted in the device's alarm log, be aware that you may need to perform actions to prevent field issues.

This chapter describes the structure of this manual and presents an overview of the Micro Motion® Coriolis Interface module for the FloBoss™ 107 Flow Manager (FB107) and the ROC800-Series Remote Operations Controller (both the ROC800 and the ROC800L). The Coriolis Interface module provides all of the functions necessary to communicate with the core processor of a Micro Motion Coriolis meter and includes an onboard RS-485 communications port that enables communications between the module and the Coriolis meter without using one of the communications ports of the FB107 or the ROC800/ROC800L.

Additionally, in simple allocation situations which do not require custody transfer, one Coriolis Interface module (which connects with up to six Coriolis meters) can take the place of transmitters. In situations requiring custody transfer and the pulse counts transmitters provide, connecting the Coriolis Interface module to the transmitter provides extensive real-time analysis of flow data.

APP 485 application modules for the ROC800/ROC800L and FB107 (including the Micro Motion Coriolis Interface module) streamline the installation process by automatically installing all point types and screens that are part of the application. APP 485 modules can house a variety of applications; for further information about additional APP 485 modules, contact your sales representative.

1.1 Scope and Organization

This document serves as the user manual for the Micro Motion Coriolis Interface Module, which is intended for use in a FB107 or ROC800/ROC800L. This manual describes how to install and configure the Coriolis Interface module (referred to as the "Coriolis Interface" or "the module" throughout the rest of this manual). You access and configure this module using ROCLINK™ 800 configuration software loaded on a personal computer running Microsoft® Windows® 2000 (with Service Pack 2), Windows XP, Windows Vista, or Windows 7.

The sections in this manual provide information in a sequence appropriate for first-time users. Once you become familiar with the procedures and the software, the manual becomes a reference tool.

This manual has the following major sections:

- *Chapter 1 – Introduction*
- *Chapter 2 – Installation*
- *Chapter 3 – Configuration*
- *Chapter 4 – Reference*

This manual assumes that you are familiar with the FB107 and the ROC800/ROC800L and its configuration. For more information, refer to the following manuals:

- *FloBoss™ 107 Flow Manager Instruction Manual* (part D301232X012).
- *ROC800-Series Remote Operations Controller Instruction Manual* (part D301217X012).
- *ROCLINK™ 800 Configuration Software User Manual (for FloBoss™ 107)* (part D301249X012).
- *ROCLINK™ 800 Configuration Software User Manual (for ROC800-Series)* (part D301250X012).
- *ROCLINK™ 800 Configuration Software User Manual (for ROC800L)* (part D301246X012).

1.2 Product Overview

The MMI Coriolis Interface module enables the FB107 or the ROC800/ROC800L to communicate directly with the core processor in up to 6 (4 on the FB107) Micro Motion Coriolis meters on the same EIA-485 (RS-485) communications port. (The module provides its own communications port for this purpose.) The module serves as an interface between Coriolis meters, transmitters, and the FB107 or ROC800/ROC800L, retrieving, validating, and then processing the data.

By supporting multiple core processors or transmitters at one time, the module eliminates the need to have one transmitter for each core processor. Additionally, it removes the need for a water cut probe in a 2-phase separator for liquid output. Finally, it manages transient mist remediation (TMR), transient bubble remediation (TBR), production value reconciliation (PVR), meter zeroing, and Smart Meter Verification (provided these functions are activated on the Coriolis meter's core processor).

The module operates in either ***continuous*** mode (during which flow never ceases) or ***dump cycle*** mode (during which, should flow drop below a minimum setpoint, the module stops accumulating flow, counts cycles, and stores cycle-specific data).

Using Modbus, the module continuously requests data from the meters. When it receives new data, the module compares the volume flow rate from the meter to the user-defined volume low flow cutoff value and performs the following actions:

- **If the value of the volume flow rate register is zero**, the parameters in the module's point type corresponding to the values

received from the meter are updated, and no further processing of the data is performed.

- **If the value is greater than zero but less than the volume low flow cutoff value**, the module considers the volume and mass accumulated to be trickle flow. The accumulated volume and mass values are added to both the daily totals parameters and the separate trickle flow totals.
- **If the value of volume flow rate is greater than the module's low flow cutoff value**, the module considers the values received during the period at which the volume flow rate remains above the volume low flow cutoff value to be part of a dump cycle. The module keeps track of the total volume and mass accumulated during a dump cycle, and updates the volume and mass totals once the dump cycle has ended. The maximum and minimum density and drive gain values that occurred during the dump cycle are also determined.

The module uses the contract hour you define using ROCLINK 800 to determine when a new contract day has begun. The module stores the maximum and minimum density and drive gain values, the number of dump cycles, and the volume and mass accumulators for the current and previous contract days. When a new contract day is reached, the module saves the values for the current contract day as the previous day values, and then resets the current day values. The module also records monthly totals for volume, mass, and the number of dump cycles. The module zeroes totals at the beginning of a new month, which occurs on the contract hour of the first day of a new month.

Note: The totals shown on the Values tab are based on the specified contract hour. These totals are independent from the Force End of Day selection (**ROC** > **Information**), and are **not updated** when you perform a Force End of Day.

The continuous mode is designed to measure gas or liquid flow when the flow is not coming from a separator monitoring system. In this mode the module continuously requests data from the meters, retrieving and saving values for Total Volume for Today, Yesterday Total Volume, Yesterday's, Monthly and the accumulated value since the last reset. The module retrieves and saves mass values for the same periods.

Note: In case of a communications failure, the module is set to "hold last value."

1.3 Program Requirements

The Micro Motion Coriolis Interface module is compatible with version 1.70 (or greater) of the FB107 firmware, with version 3.61 (or greater) of the ROC800 firmware, with version 1.41 (or greater) of the ROC800L firmware, and with version 2.40 (or greater) of the ROCLINK 800 configuration software.

If used in conjunction with user programs, the Micro Motion Coriolis Interface module works with version 1.02 (or greater) of the Linear Meter Flow Calculation program.

The Coriolis Interface module supports the following firmware versions of these core processors and transmitters:

Device Type	Firmware Version
700 Core Processors	3.2 or greater
800 Enhanced Core Processor	3.9 or greater
1500 Transmitter	6.6 or greater
1700 Transmitter	6.6 or greater
2500 Transmitter	6.6 or greater
2700 Transmitter	6.6 or greater
3000-Series Transmitter	8.2 or greater

Note: The comm settings for the Interface module are fixed at a baud rate of 19,200, no parity, 8 data bits, and 1 stop bit. You cannot change these values; the meter's core processor detects this protocol and matches them automatically. However, if you are using transmitters, you must use Micro Motion's ProLink® software to change the comm settings on those transmitters to match these settings.

Chapter 2 – Installation

This chapter provides instructions for installing the Coriolis Interface module. Read *Section 1.3* of this manual for program requirements. The FB107 and the ROC800/ROC800L each support only one Coriolis Interface module.

Note: The FB107 can support only one APP 485 module. If you already have an APP 485-based application in your FB107, consider which application is most appropriate for your needs.

General Procedure

Installation requires that you perform a number of steps in a specific sequence:

1. Power down the FB107 or ROC800/ROC800L.
2. Install the application module (refer to *Section 2.1*).
3. Wire the module (refer to *Section 2.2*).
4. Power up the FB107 or ROC800/ROC800L.
5. Configure the module (refer to *Chapter 3*).

2.1 Installing the Module

The application module occupies the standard footprint of an FB107 or ROC800/ROC800L I/O or communications module. Place the module in any empty slot on the ROC800/ROC800L or FB107.

To ensure that the device recognizes the module, you must perform a warm start (**ROC** > **Flags** > **Warm Start**).

2.2 Wiring the Module

Connect the Coriolis meter(s) to the communications port on the module using between 16 and 24 AWG wiring. *Figure 1* and *Figure 2* show example wiring between the module and several meters.

Note: Coriolis meters **must** be externally powered.

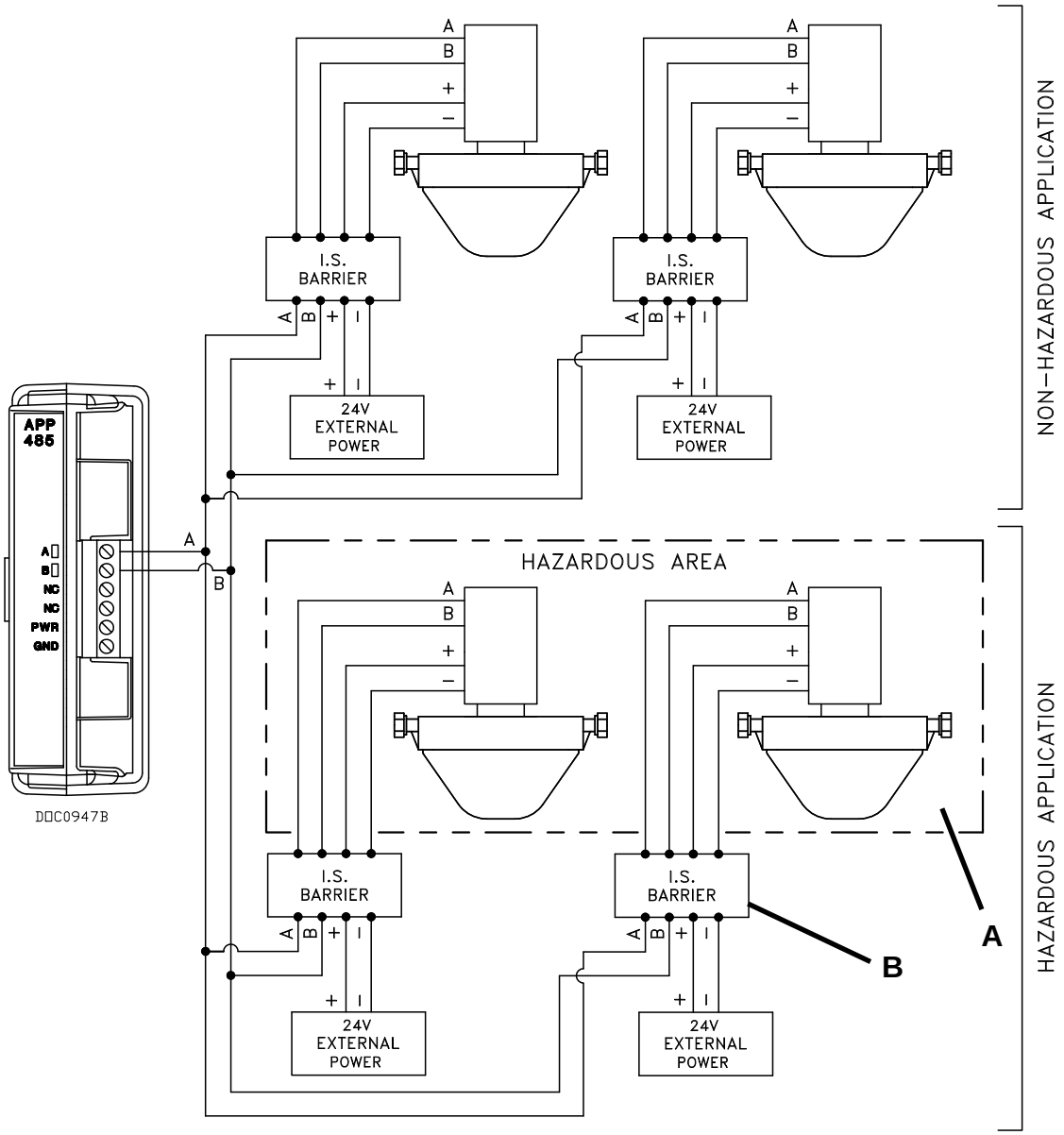

Figure 1. Module Wiring

A Micro Motion 700/800 Coriolis Meter with Internal Core Processor
B Micro Motion MVD Direct Connect™ Safety Barrier

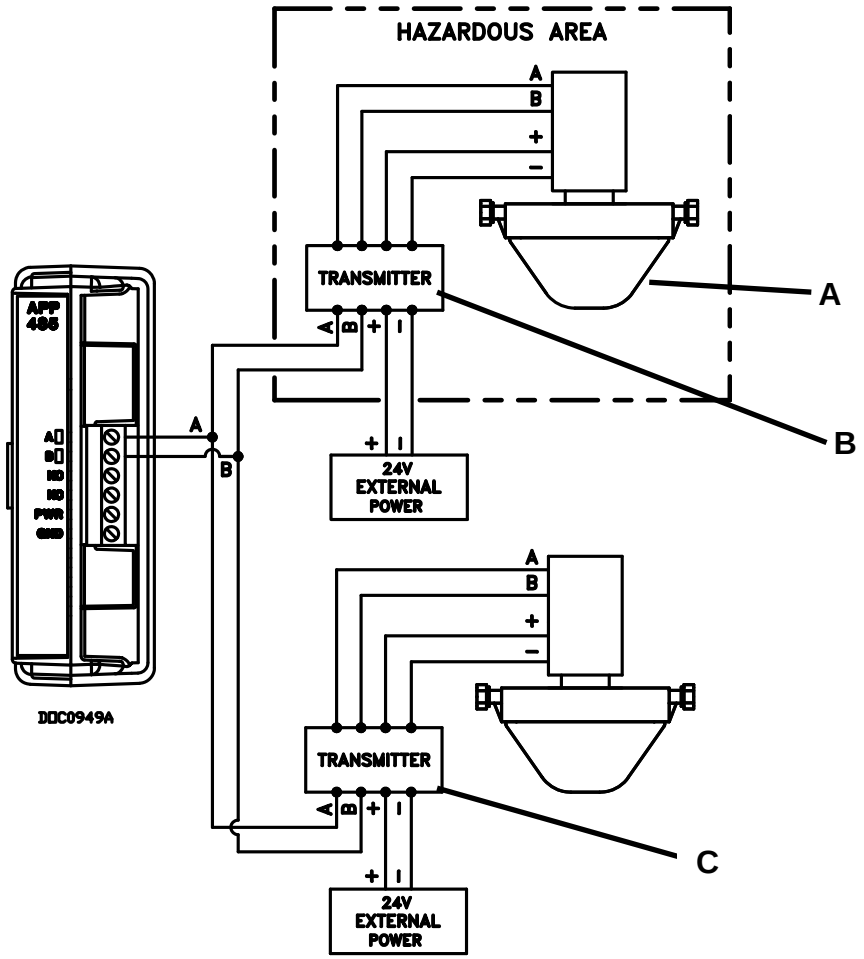

Figure 2. Module Wiring

A Micro Motion 700/800 Coriolis Meter with Internal Core Processor
B Micro Motion 1700 (single variable), 2700 (multi-variable), or 3000-Series transmitter suited for use in a hazardous area
C Micro Motion 1500 (single variable), 2500 (multi-variable), or 3000-Series transmitter suited for used in a non-hazardous area.

For best results, all Micro Motion Coriolis meter and transmitters require 24Vdc power. The following table outlines the typical power draw for standard Coriolis meter configurations. When designing an application, consider these power requirements.

Table 1. Configuration Power Requirements

Configuration	24 VDC	Current
Sensor with Core Processor Only	768 mW	32 mA
Sensor with Core Processor & Barrier	1440 mW	60 mA
Sensor with 1500-2500 Transmitter	3432 mW	143 mA
Sensor with 1700-2700 Transmitter	6000 mW	250 mA
Sensor with 3700 Net Oil Transmitter	7420 mW	309 mA

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Chapter 3 – Configuration

After you have successfully installed the MMI Coriolis Interface module and wired the meter to the module, start ROCLINK 800 and configure the module using the Coriolis Setup and Values screen (see *Section 3.1*). Use the screen – and its component tabs – to configure communications with the Coriolis meter, perform calibration, view flow rates and totals, and view diagnostic information.

To ensure that the device recognizes the module, you must perform a warm start (**ROC** > **Flags** > **Warm Start**).

Note: Once the module is installed, you can identify a ROC800 Coriolis Interface module from the label on the face of the module. On the FB107, the label is on the side of the physical case. Using ROCLINK 800, click the APP 485 module shown in the ROCLINK 800 graphic display. A label appears identifying the module (see *Figures 3 and 4*).

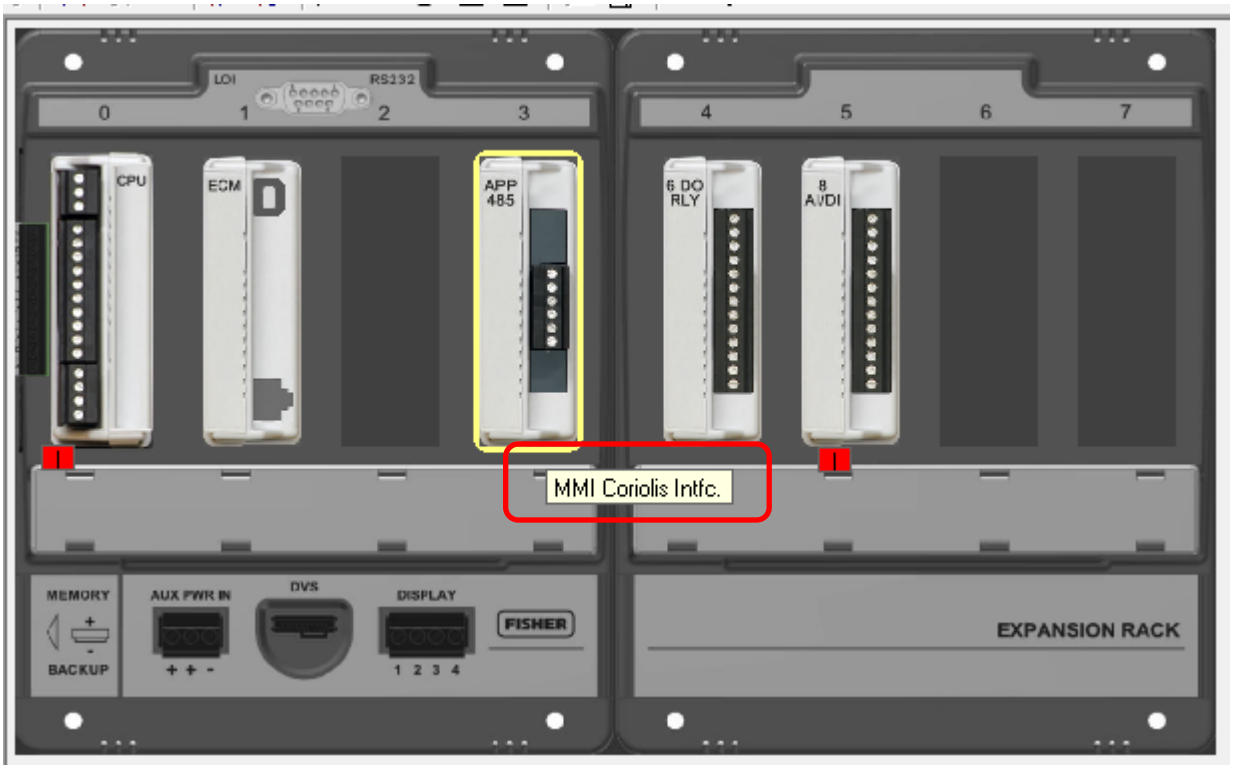

Figure 3. Micro Motion Coriolis Interface Module (FB107)

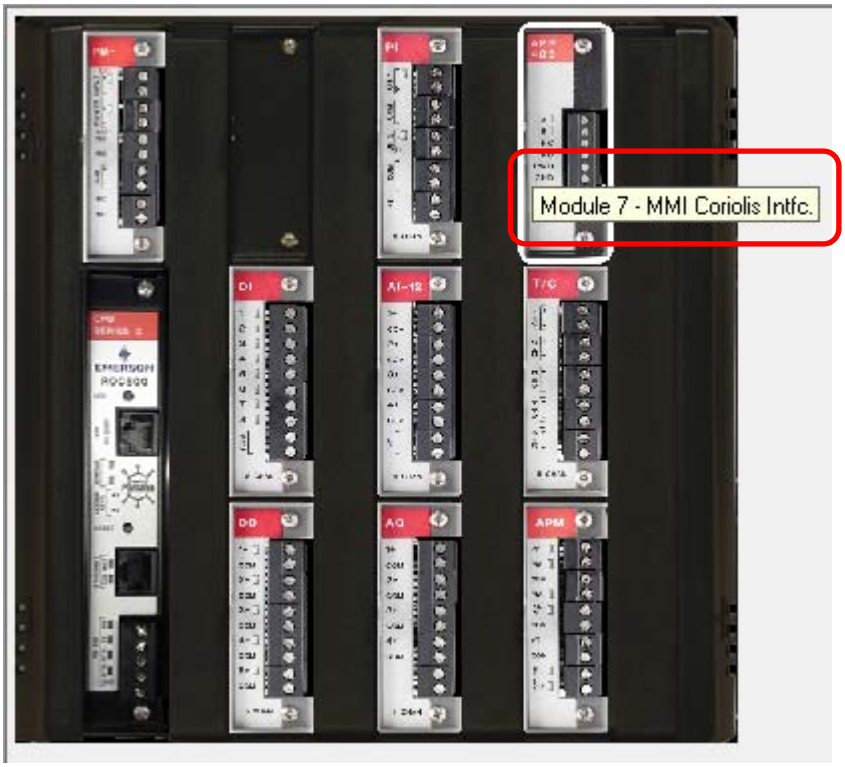

Figure 4. Micro Motion Coriolis Interface Module (ROC800)

You must configure the module **before** you can establish communications with the Coriolis meter. To configure the module (after successfully installing and wiring the module) proceed through the screens as shown in this chapter.

3.1 Coriolis Setup and Values Screen

Note: The Coriolis Setup and Values screen is identical for both the FB107 and ROC800/ROC800L.

Use this screen to configure communications with the Coriolis meter, perform meter calibration, view flow rates and totals, and view diagnostic information. To access this screen:

For the ROC800

1. From the Directory Tree, double-click **User Display**.
2. Double-click **Display #66 – Coriolis Setup and Values.** The Coriolis Setup and Values screen displays.

For the FB107

1. From the Directory Tree, double-click **Application Module**.
2. Double-click **MMI Coriolis Intfc.**
3. Double-click **Display #66, Coriolis Setup and Values.**
4. Double-click **1 – Meter #1.** The Coriolis Setup and Values screen displays.

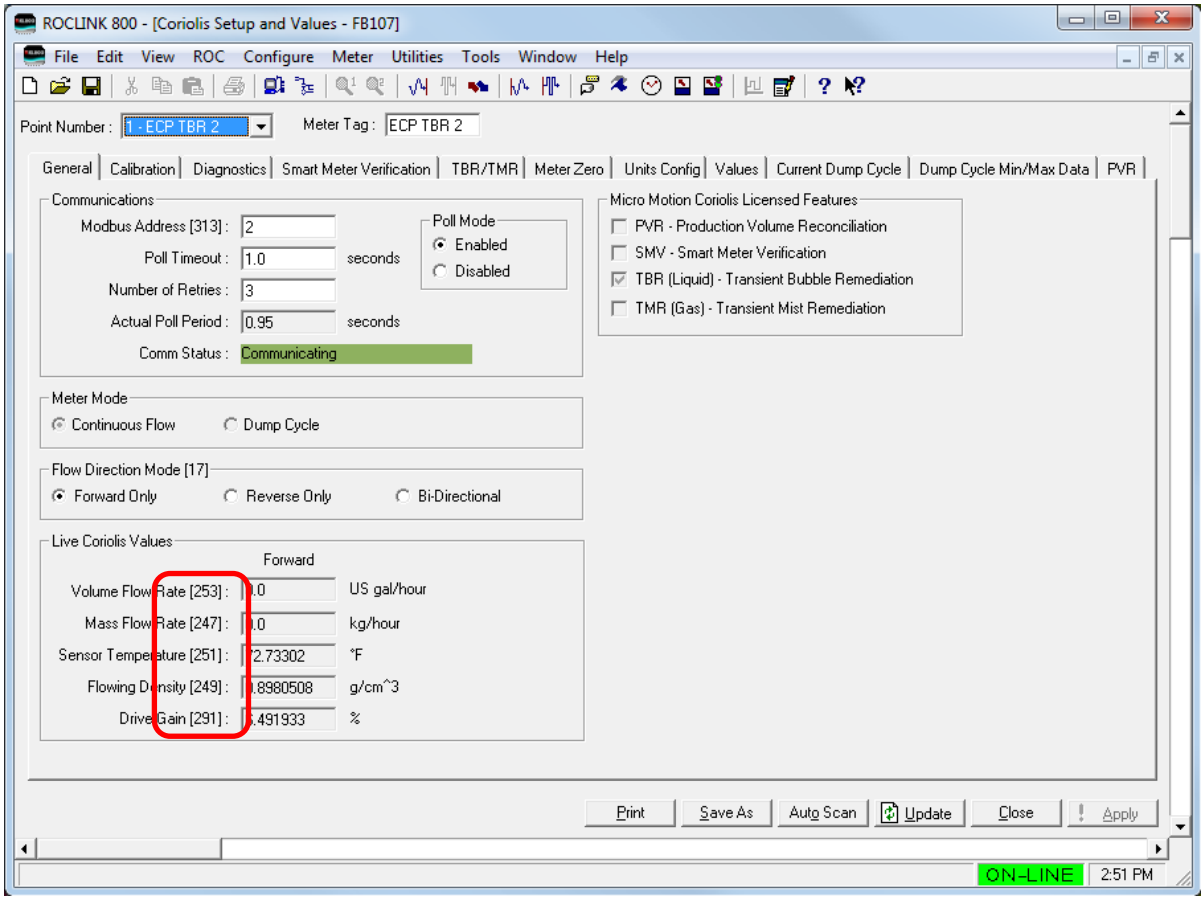
ROCLINK 800 - [Coriolis Setup and Values - FB107]
File Edit View ROC Configure Meter Utilities Tools Window Help
Point Number : 1 - ECP TBR 2
Meter Tag : ECP TBR 2
General Calibration Diagnostics Smart Meter Verification TBR/TMR Meter Zero Units Config Values Current Dump Cycle Dump Cycle Min/Max Data PVR
Communications
Modbus Address [313] : 2
Poll Timeout : 1.0 seconds
Number of Retries : 3
Actual Poll Period : 0.95 seconds
Comm Status : Communicating
Poll Mode
Enabled
Disabled
Micro Motion Coriolis Licensed Features
PVR - Production Volume Reconciliation
SMV - Smart Meter Verification
TBR (Liquid) - Transient Bubble Remediation
TMR (Gas) - Transient Mist Remediation
Meter Mode
Continuous Flow
Dump Cycle
Flow Direction Mode [17]
Forward Only
Reverse Only
Bi-Directional
Live Coriolis Values
Forward
Volume Flow Rate [253] : 0.0 US gal/hour
Mass Flow Rate [247] : 0.0 kg/hour
Sensor Temperature [251] : 72.73302 °F
Flowing Density [249] : 1.8980508 g/cm^3
Drive Gain [291] : 4.491933 %
Print Save As Auto Scan Update Close Apply
ON-LINE 2:51 PM

Figure 5. Coriolis Setup and Values

Notes:

- The Coriolis Setup and Values screen has a tab format. *Sections 3.1.1* through *3.1.11* discuss the requirements for each tab on the Coriolis Setup and Values screen.
- Two fields (Point Number and Meter Tag) at the top of the screen appear on all tabs (see *Figure 5*).
- For many fields on these screens, bracketed numbers follow the field labels (see *Figure 5*). These numbers identify the specific Modbus register in the Coriolis meter's core processor that provides the value.

1. Review the values in the following fields:

Field	Description
Point Number	Selects the Coriolis meter to configure. Click ▼ to display a drop-down menu of all meters.
Meter Tag	Sets a short (10-character) identifier for the selected Coriolis meter.

Note: The default value for the Point Number field is **x – Meter#x**, corresponding to the number of meters your device supports (**1 – Meter#1**, **2 – Meter#2**, and so on). Similarly, **Meter**

Tag is the default value for the Meter Tag field until you provide a value. The values displayed in the examples in this documentation are for illustrative purposes only and do not reflect the factory default.

2. Click **Apply** to save any changes you have made to this screen.
3. Proceed to *Section 3.1.1* to configure the General tab.

3.1.1 Coriolis Setup and Values – General Tab

Use this tab (which displays when you access the Coriolis Setup and Values screen) to configure communications with one or more Coriolis meters, configure and enable polling, and set communications parameters.

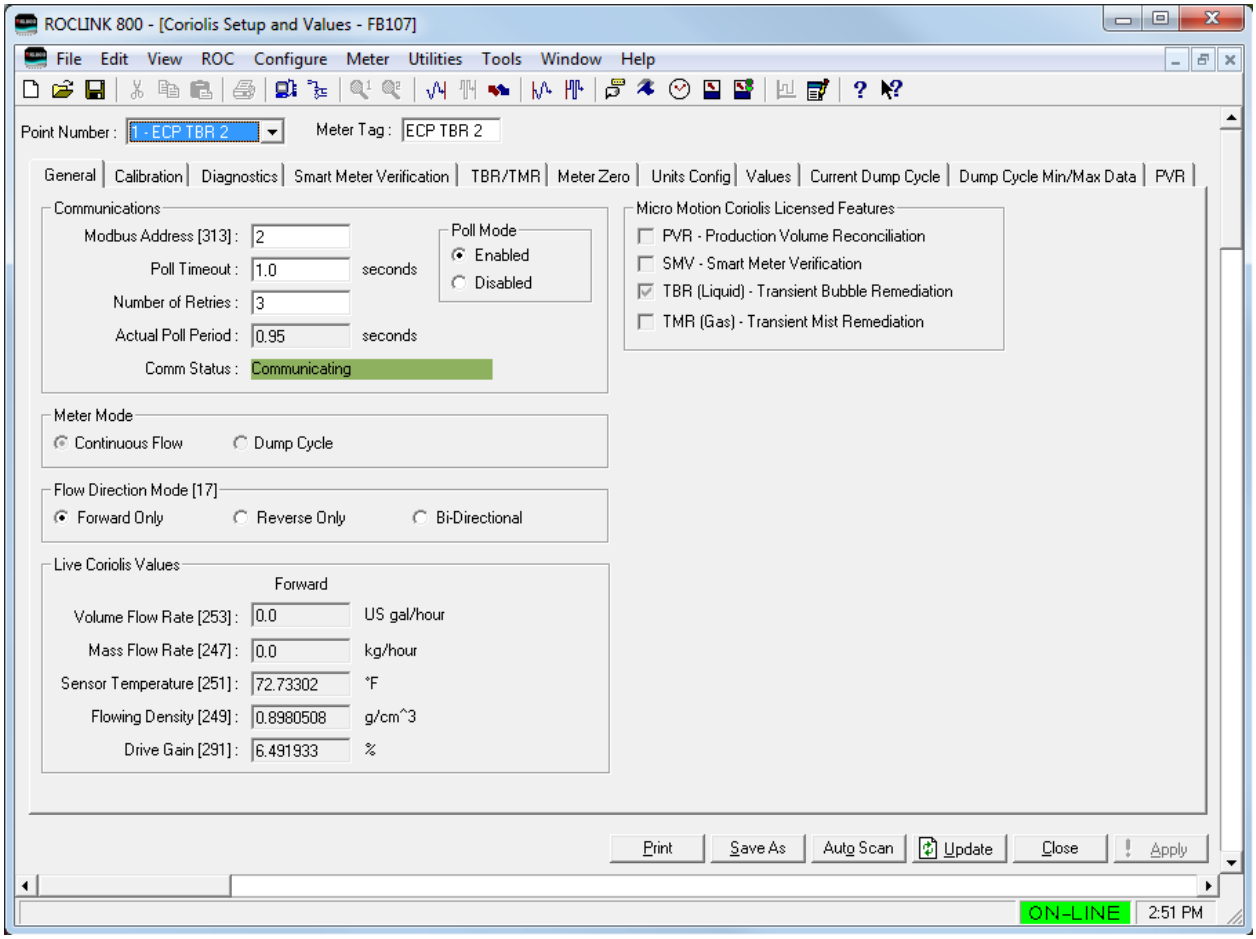
ROCLINK 800 - [Coriolis Setup and Values - FB107]
File Edit View ROC Configure Meter Utilities Tools Window Help
Point Number : 1 - ECP TBR 2
Meter Tag : ECP TBR 2
General Calibration Diagnostics Smart Meter Verification TBR/TMR Meter Zero Units Config Values Current Dump Cycle Dump Cycle Min/Max Data PVR
Communications
Modbus Address [313] : 2
Poll Timeout : 1.0 seconds
Number of Retries : 3
Actual Poll Period : 0.95 seconds
Comm Status : Communicating
Poll Mode
Enabled
Disabled
Micro Motion Coriolis Licensed Features
PVR - Production Volume Reconciliation
SMV - Smart Meter Verification
TBR (Liquid) - Transient Bubble Remediation
TMR (Gas) - Transient Mist Remediation
Meter Mode
Continuous Flow
Dump Cycle
Flow Direction Mode [17]
Forward Only
Reverse Only
Bi-Directional
Live Coriolis Values
Forward
Volume Flow Rate [253] : 0.0 US gal/hour
Mass Flow Rate [247] : 0.0 kg/hour
Sensor Temperature [251] : 72.73302 °F
Flowing Density [249] : 0.8980508 g/cm^3
Drive Gain [291] : 6.491933 %
Print
Save As
Auto Scan
Update
Close
Apply
ON-LINE
2:51 PM

Figure 6. Coriolis Setup and Values – General Tab

1. Review the values in the following fields:

Field	Description
Communications	
Modbus Address	Enter the Modbus address of the target Coriolis device. Valid values are 1–15, 32–47, 64–79, and 96–110. The default is **255**. **Note**: The Modbus address you select must be unique and not assigned to any other meter connected to this module. That is, you cannot select Address 2 for meter 2 if that address is already assigned to meter 1.

Field	Description
Poll Timeout	Sets the amount of time, in seconds, the program waits to receive a response from a Coriolis meter. If a response is not received within the specified time period, the message is retried or the meter is marked with a response timeout status in the Comm Status field.
Number of Retries	Sets the number of times the program attempts to successfully communicate with the selected Coriolis meter before issuing a response timeout status in the Comm Status field. If a meter does not respond within the specified number of retries, the program attempts to restore communications with the meter every 10 seconds.
Actual Poll Period	This **read-only** field shows the period of time, in seconds, between meter polls.
Comm Status	This **read-only** field shows the current communication status with the selected meter. Valid values are Communication Disabled, Communicating, Configuring Slot Registers, Retrying, Response Timeout, Invalid CRC, Invalid Response Format, and Slot Register Configuration Failed, Slow Poll Mode, Reset Totals Failed, and Incompatible Target Device. **Note**: "Slow poll mode" occurs when the module's poll request fails, all retries are exhausted, and the device is not responding (which might occur if the connecting wire has been cut). In this case, the device automatically slows polling, shifting from a once-per-second poll sequence to a once-every-10-seconds poll sequence. Once the communication problem is resolved, normal polling resumes within 10 seconds.
Poll Mode	Enables polling between the module and the selected Coriolis meter. Valid values are **Enabled** and **Disabled**. The default is **Disabled**.
Meter Mode	Defines how the module handles flow. Valid values are **Continuous Flow** and **Dump Cycle**. The default is **Continuous Flow**. For liquid flow measurement, use Dump Cycle mode. For gas flow measurement, use Continuous mode.
Flow Direction Mode	Sets the Flow Direction configured for the meter. The default is **Forward Only**. **Note**: Bi-Directional is available **only** when using the Continuous Flow meter mode.
Live Coriolis Values	

Field	Description
Volume Flow Rate	This **read-only** field shows the current volume flow rate, as reported by the meter. Configure display units using the Units Configuration tab. The Flow Direction Mode you select controls the values shown in this frame. Values in the Forward column display only if you select **Forward Only** or **Bi-Directional**. Values in the Reverse column display only if you select **Reverse Only** or **Bi-Directional**.
Mass Flow Rate	This **read-only** field shows the current mass flow rate, as reported by the meter. Configure display units using the Units Configuration tab. The Flow Direction Mode you select controls the values shown in this frame. Values in the Forward column display only if you select **Forward Only** or **Bi-Directional**. Values in the Reverse column display only if you select **Reverse Only** or **Bi-Directional**.
Sensor Temperature	This **read-only** field shows the current temperature value retrieved from the meter. You configure the display units using the Units Configuration tab.
Flowing Density	This **read-only** field shows the current density value retrieved from the meter. Configure display units using the Units Configuration tab.
Drive Gain	This **read-only** field shows, as a percentage, the current drive gain value.
Micro Motion Coriolis Licensed Features	This **read-only** field shows the specific licensed features of the Coriolis meter which are currently active.

2. Click **Apply** to save any changes you have made to this screen.
3. Proceed to *Section 3.1.2* to configure the Calibration tab.

3.1.2 Coriolis Setup and Values – Calibration Tab

Use this screen to perform and view meter calibration factors. To access this screen:

1. Select the **Calibration** tab. The Calibration screen displays:

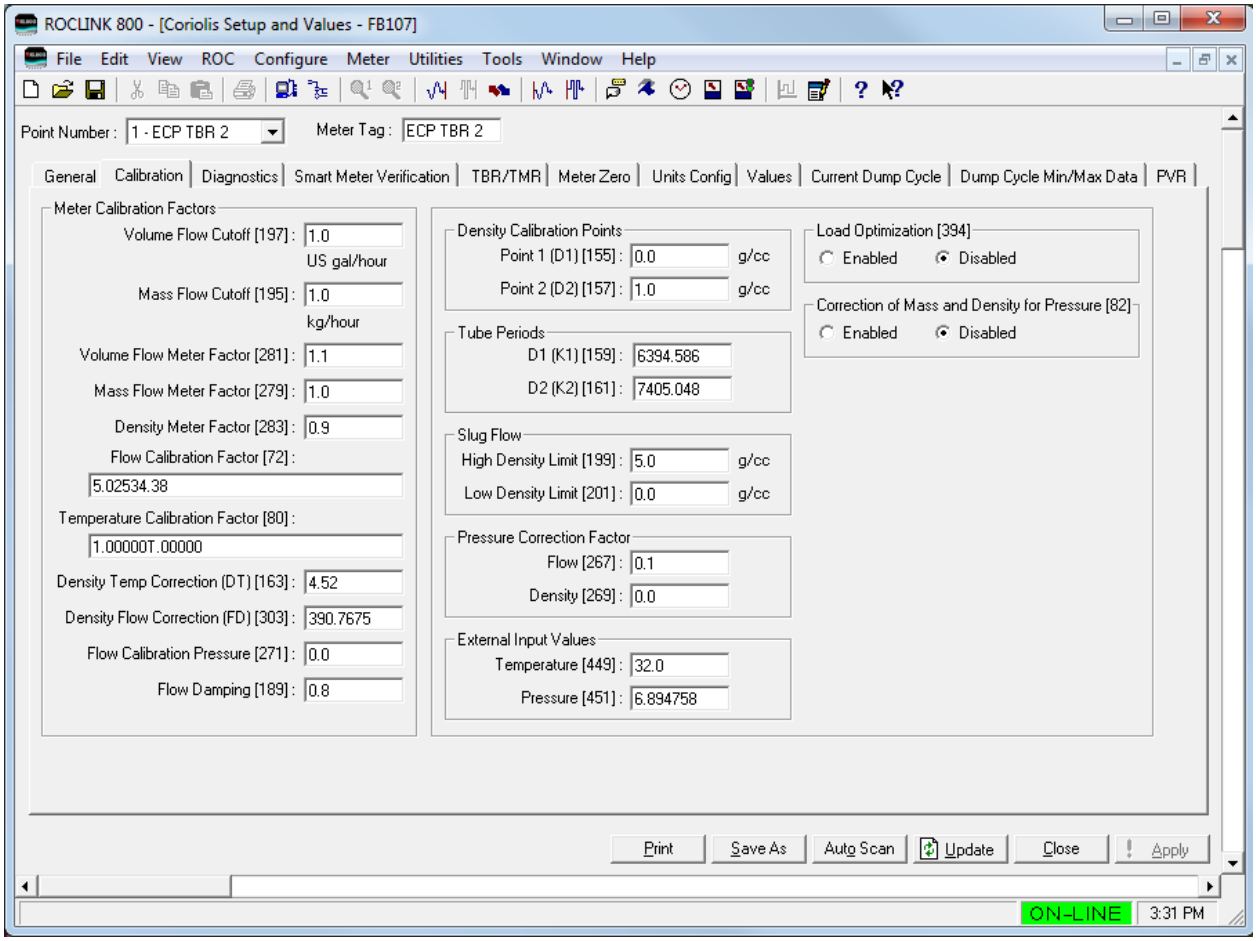
ROCLINK 800 - [Coriolis Setup and Values - FB107]
File Edit View ROC Configure Meter Utilities Tools Window Help
Point Number : 1 - ECP TBR 2
Meter Tag : ECP TBR 2
General Calibration Diagnostics Smart Meter Verification TBR/TMR Meter Zero Units Config Values Current Dump Cycle Dump Cycle Min/Max Data PVR
Meter Calibration Factors
Volume Flow Cutoff [197] : 1.0
US gal/hour
Mass Flow Cutoff [195] : 1.0
kg/hour
Volume Flow Meter Factor [281] : 1.1
Mass Flow Meter Factor [279] : 1.0
Density Meter Factor [283] : 0.9
Flow Calibration Factor [72] :
5.02534.38
Temperature Calibration Factor [80] :
1.00000T.00000
Density Temp Correction (DT) [163] : 4.52
Density Flow Correction (FD) [303] : 390.7675
Flow Calibration Pressure [271] : 0.0
Flow Damping [189] : 0.8
Density Calibration Points
Point 1 (D1) [155] : 0.0 g/cc
Point 2 (D2) [157] : 1.0 g/cc
Tube Periods
D1 (K1) [159] : 6394.586
D2 (K2) [161] : 7405.048
Slug Flow
High Density Limit [199] : 5.0 g/cc
Low Density Limit [201] : 0.0 g/cc
Pressure Correction Factor
Flow [267] : 0.1
Density [269] : 0.0
External Input Values
Temperature [449] : 32.0
Pressure [451] : 6.894758
Load Optimization [394]
Enabled Disabled
Correction of Mass and Density for Pressure [82]
Enabled Disabled
Print Save As Auto Scan Update Close Apply
ON-LINE
3:31 PM

Figure 7. Coriolis Setup and Values – Calibration Tab

2. Review—and change as necessary—the values in the following fields:

Field	Description
Volume Flow Cutoff	Sets the Volume Flow Cutoff value for the target Coriolis meter. The default is **0**.
Mass Flow Cutoff	Sets the Mass Flow Cutoff value for the target Coriolis meter. The default is **0**.
Volume Flow Meter Factor	Sets the Volume Flow Meter Factor value for the target Coriolis meter. Valid values are from **0.8** to **1.2**. The default is **0**.
Mass Flow Meter Factor	Sets the Mass Flow Meter value for the target Coriolis meter. Valid values are from **0.8** to **1.2**. The default is **0**.

Field	Description
Density Meter Factor	Sets the Density Meter Factor value for the selected Coriolis meter. Enter any decimal value greater than zero. The system multiplies this value by the live density reading to produce the published density value.
Flow Calibration Factor	Sets the Flow Calibration Factor value for the selected Coriolis meter. The default is **0**.
Temperature Calibration Factor	Sets the Temperature Calibration Factor value for the selected Coriolis meter. The default is **0**.
Density Temp Correction (DT)	Sets the Density Temperature Correction value for the selected Coriolis meter. Valid values are from -20 to 20. The default is **0.0**.
Density Flow Correction (FD)	Sets the Density Flow Correction value for the selected Coriolis meter. The default is **0.0**.
Flow Calibration Pressure	Sets the Flow Calibration Pressure value of the selected Coriolis meter. Enter any decimal value greater than zero. The default is **0.0**.
Flow Damping	Sets the flow rate internal damping in seconds. Valid values are from 0 to 60 seconds. The default is **0.0**.
Density Calibration Points	Sets the values for Density Calibration Point 1 (D1) and Density Calibration Point 2 (D2). Valid values are from 0 to 5 g/cc. The default is **0.0**.
Tube Periods	Sets the values for Tube Period D1 (K1) and Tube Period D2 (K2) from the physical Coriolis sensor plates. K1 is the tube period when the sensor is filled with a fluid of Density D1. K2 is the tube period when the sensor is filled with a fluid of Density D1. Both of these values are in units of microseconds. Valid values are from 1000 to 50000. The default is **0.0**.
Slug Flow	Sets, in g/cc, the high and low density values for slug flow. The high density limit should be greater than the low value. Valid values are from 0 to 5 g/cc. The default is **0.0**.
Pressure Correction Factor	Sets the values for Pressure Correction Factor for flow and density. Valid values are from -0.1 to 0.1. The default is **0.0**.
External Input Values	Sets the values for External Input Values for temperature and pressure. Valid temperature values range from –240 °C to 450 °C. Valid pressure values range from –.5 to 10000 BAR. The default for both is **0.0**.
Load Optimization	Enables Load Optimization. Valid values are **Enabled** and **Disabled**. Default is **Disabled**.

Field	Description
Correction of Mass and Density for Pressure	Enables the module to calculate compensation for the effect of high pressure on the measurement accuracy of the Coriolis mass flow and density. This calculation requires that you first provide flow and density values for the Pressure Correction Factors, and you must provide a pressure value for the External Input Value. Valid values are **Enabled** and **Disabled**. The default is **Disabled.**

3. Click **Apply** to save any changes you have made to this screen.
4. Proceed to *Section 3.1.3* to configure the Diagnostics tab.

3.1.3 Coriolis Setup and Values – Diagnostics Tab

Use this screen to view the meter status and diagnostic messages for the selected Coriolis meter. To access this screen:

1. Select the **Diagnostics** tab. The Diagnostic screen displays:

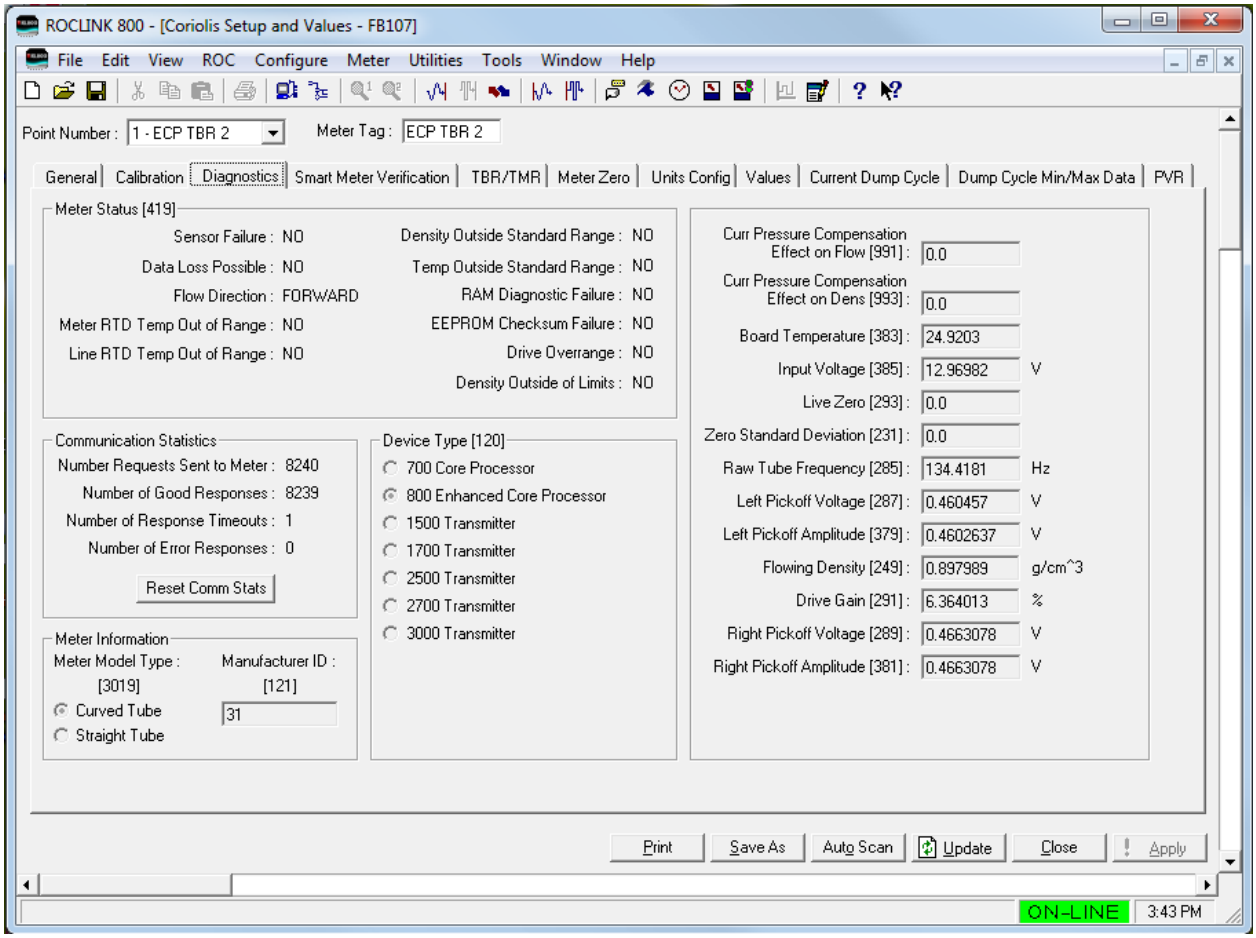
ROCLINK 800 - [Coriolis Setup and Values - FB107]
File Edit View ROC Configure Meter Utilities Tools Window Help
Point Number : 1 - ECP TBR 2
Meter Tag : ECP TBR 2
General Calibration Diagnostics Smart Meter Verification TBR/TMR Meter Zero Units Config Values Current Dump Cycle Dump Cycle Min/Max Data PVR
Meter Status [419]
Sensor Failure : NO
Data Loss Possible : NO
Flow Direction : FORWARD
Meter RTD Temp Out of Range : NO
Line RTD Temp Out of Range : NO
Density Outside Standard Range : NO
Temp Outside Standard Range : NO
RAM Diagnostic Failure : NO
EEPROM Checksum Failure : NO
Drive Overrange : NO
Density Outside of Limits : NO
Communication Statistics
Number Requests Sent to Meter : 8240
Number of Good Responses : 8239
Number of Response Timeouts : 1
Number of Error Responses : 0
Reset Comm Stats
Device Type [120]
700 Core Processor
800 Enhanced Core Processor
1500 Transmitter
1700 Transmitter
2500 Transmitter
2700 Transmitter
3000 Transmitter
Meter Information
Meter Model Type : [3019]
Manufacturer ID : [121]
Curved Tube
Straight Tube
31
Curr Pressure Compensation Effect on Flow [991] : 0.0
Curr Pressure Compensation Effect on Dens [993] : 0.0
Board Temperature [383] : 24.9203
Input Voltage [385] : 12.96982 V
Live Zero [293] : 0.0
Zero Standard Deviation [231] : 0.0
Raw Tube Frequency [285] : 134.4181 Hz
Left Pickoff Voltage [287] : 0.460457 V
Left Pickoff Amplitude [379] : 0.4602637 V
Flowing Density [249] : 0.897989 g/cm^3
Drive Gain [291] : 6.364013 %
Right Pickoff Voltage [289] : 0.4663078 V
Right Pickoff Amplitude [381] : 0.4663078 V
Print Save As Auto Scan Update Close Apply
ON-LINE
3:43 PM

Figure 8. Coriolis Setup and Values – Diagnostics Tab

2. Review the values in the following fields:

Field	Description
Meter Status	
Sensor Failure	This **read-only** field shows the current status of the selected meter based on the value in the primary Coriolis status register. Valid values are **Yes** and **No**.
Data Loss Possible	This **read-only** field shows the meter's possibility of data loss. Valid values are **Yes** and **No**.
Flow Direction	This **read-only** field shows the meter's flow direction. Valid values are **Forward** or **Reverse**.

Field	Description
Meter RTD Temp Out of Range	This **read-only** field shows whether the temperature for the meter's RTD is out of range. Valid values are **Yes** and **No**.
Line RTD Temp Out of Range	This **read-only** field shows whether the temperature for the line's RTD is out of range. Valid values are **Yes** and **No**.
Density Outside Standard Range	This **read-only** field shows whether the meter's reported density is outside of standard API ranges. Valid values are **Yes** and **No**.
Temp. Outside Standard Range	This **read-only** field shows whether the meter's temperature is outside of standard API ranges. Valid values are **Yes** and **No**.
RAM Diagnostic Failure	This **read-only** field shows whether the RAM diagnostic procedure (initiated during a power reset) has failed. Valid values are **Yes** and **No**.
EEPROM Checksum Failure	This **read-only** field shows whether the EEPROM Checksum procedure (initiated during a power reset) has failed. Valid values are **Yes** and **No**.
Drive Overrange	This **read-only** field shows whether the drive is outside of its proscribed range. Valid values are **Yes** and **No**.
Density Outside of Limits	This **read-only** field shows whether the density is outside of standard limits. Valid values are **Yes** and **No**.
Communication Statistics	
Number Requests Sent to Meter	This **read-only** field shows the total number of Modbus requests the module has sent to the selected meter.
Number of Good Responses	This **read-only** field shows the total number of valid Modbus responses the module has received from the selected meter.
Number of Response Timeouts	This **read-only** field shows the total number of instances when the program has not received a response within the timeout period from the selected meter.
Number of Error Reponses	This **read-only** field shows the total number of erroneous Modbus responses the module has received from the selected meter.
Reset Comm Stats	Click to reset all communication statistics values displayed in the Communication Statistics frame.
Meter Information	
Meter Model Type	This **read-only** field shows the type of sensor for the selected meter. Valid values are **Curved Tube** and **Straight Tube**.

Field	Description
Manufacturer ID	This **read-only** field shows the manufacturer's ID for the selected meter.
Device Type	This **read-only** field shows the specific type of meter or transmitter connected to the module.
Current Pressure Compensation Effect on Flow	This **read-only** field shows the current pressure compensation effect on flow of the Coriolis meter. Default value is **0**.
Current Pressure Compensation Effect on Density	This **read-only** field shows the current pressure compensation effect on density of the Coriolis meter. Default value is **0**.
Board Temperature	This **read-only** field shows the board temperature of the selected meter. Default value is **0**.
Input Voltage	This **read-only** field shows the input voltage of the selected meter. Default value is **0**.
Live Zero	This **read-only** field shows the live zero in mass flow of the selected meter. Default value is **0**.
Zero Standard Deviation	This **read-only** field shows the zero standard deviation value of the selected meter. Default value is **0**.
Raw Tube Frequency	This **read-only** field shows the raw tube frequency in Hz of the selected meter. Default value is **0**.
Left Pickoff Voltage	This **read-only** field shows the left pickoff voltage of the selected meter. Default value is **0**.
Left Pickoff Amplitude	This **read-only** field shows the left pickoff amplitude in volts of the selected meter. Default value is **0**.
Right Pickoff Voltage	This **read-only** field shows the right pickoff voltage of the selected meter. Default value is **0**.
Right Pickoff Amplitude	This **read-only** field shows the right pickoff amplitude of the selected meter. Default value is **0**.

3. Proceed to *Section 3.1.4* to configure the Smart Meter Verification tab.

3.1.4 Coriolis Setup and Values – Smart Meter Verification

Use this screen to view the Smart Meter Verification status for the selected Coriolis meter. This screen displays **only** if Smart Meter Verification is available for that sensor **and only** if that sensor is connected to a Coriolis meter using the 800 enhanced core processor.

Note: The message *Feature not supported on this Micro Motion meter* displays if this meter does not support Smart Meter Verification.

To access this screen:

1. Select the **Smart Meter Verification** tab. The Smart Meter Verification screen displays:

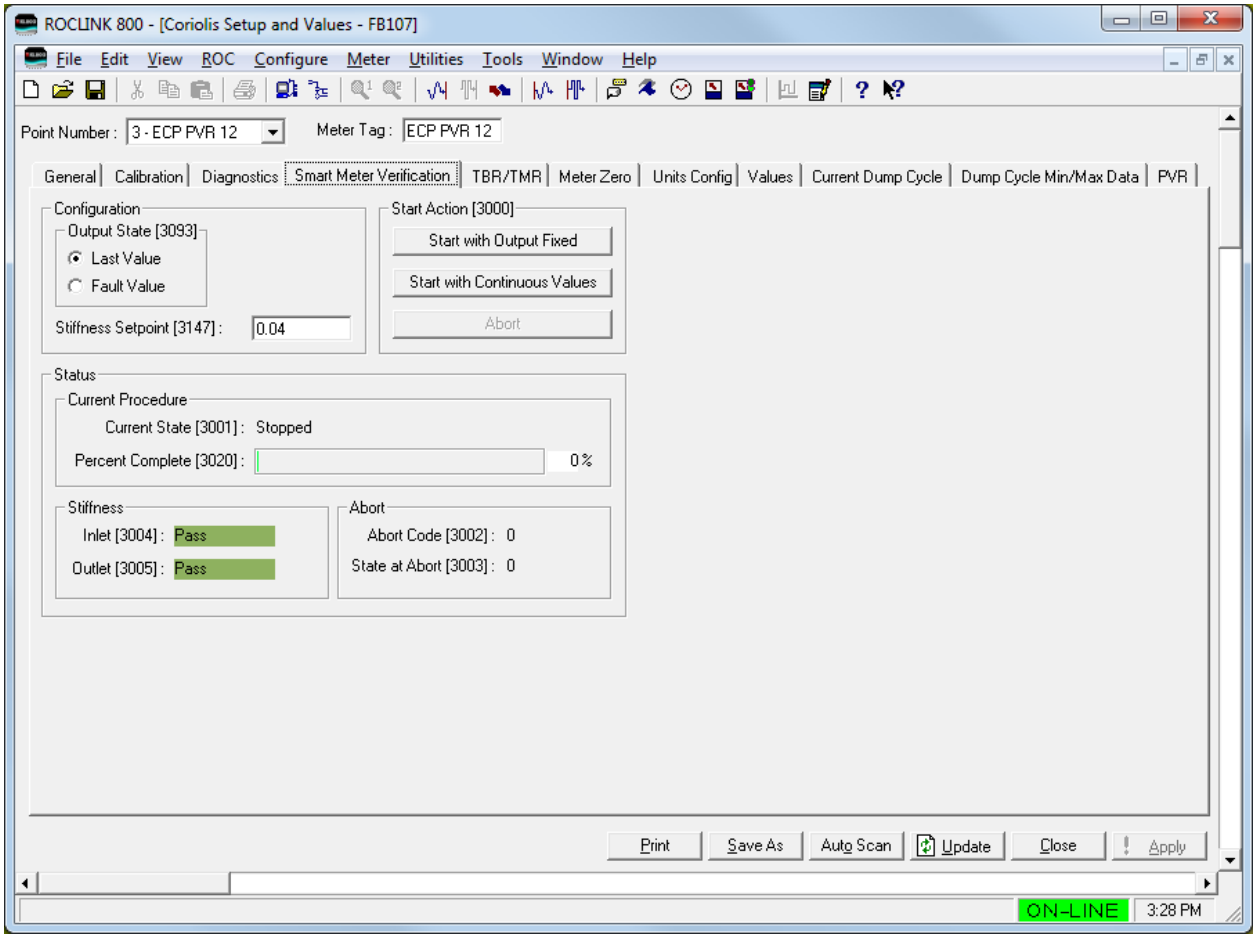

Figure 9. Coriolis Setup and Values – Smart Meter Verification Tab

2. Review—and change as necessary—the values in the following fields:

Field	Description
Output State	Sets the output state of the Smart Meter during the verification procedure. Default is **Last Value**.

Field	Description
Stiffness Setpoint	Sets the stiffness setpoint for the Smart Meter verification. Valid values range from 0.0025 to 0.4.
Start Action	Sets the value the meter uses when initiating the Smart Meter verification process. Default is **Start with Output Fixed**.
Current State	This **read-only** field shows the current state of the verification. Valid values are **Stopped** and **Running**.
Percent Complete	This **read-only** field shows the completion percentage of the current verification procedure.
Inlet	This **read-only** field shows the inlet stiffness value for the verification. Valid values are 0 (In Limits) and 1 (Out of Limits).
Outlet	This **read-only** field shows the outlet stiffness value for the verification. Valid values are 0 (In Limits) and 1 (Out of Limits).
Abort Code	This **read-only** field shows the Abort (Error) Code for the previous verification. Valid values are: 0 = No Error 1 = User Initiated Abort 2 = Frequency Drift 3 = Unstable flow 4= No Air 5 = No Water Reference 6 = Missing Configuration Data 7 = General drive error 8 = Delta T erratic 9 = Delta T too high 10 = State running 11 = State completed 12 = Meter verification data error 13 = Unit has not been calibrated on air 14 = Unit has not been calibrated on water 15 = Meter verification configuration items are not correct
State at Abort	This **read-only** field shows the state of the verification when the last abort occurred. Valid values are 16 (SMV Completed) and 0-15 (SMV Aborted before completion).
Start Meter Verification	Click to begin the verification process. **Note:** The label on this button changes with the state of the verification. Once the verification begins, the label changes to **Abort**.

3. Click **Apply** to save any changes you have made to this screen.
4. Proceed to *Section 3.1.5* to configure the TBR/TMR tab.

3.1.5 Coriolis Setup and Values – TBR/TMR

Transient bubble remediation (TBR) applies **only** to **liquid** flow; transient mist remediation (TMR) applies **only** to **gas** flow. This screen displays only if the connected Micro Motion Coriolis device has the factory-enabled TBR or TMR feature. Otherwise the message *Feature not supported on this Micro Motion meter* displays. Additionally, If you are connecting to a Micro Motion transmitter (models 1500, 1700, 2500, 2700, or 3000-series), this tab is **not** available.

Use this screen to configure and view the TBR and TMR settings for the selected Coriolis meter.

Note: The TBR/TMR screen shown in *Figure 10* is a **composite,** showing **both** TBR **and** TMR values. It is **only** an example for documentation purposes and **would not** occur in a live system.

To access this screen:

1. Select the **TBR/TMR** tab. The TBR/TMR screen displays.

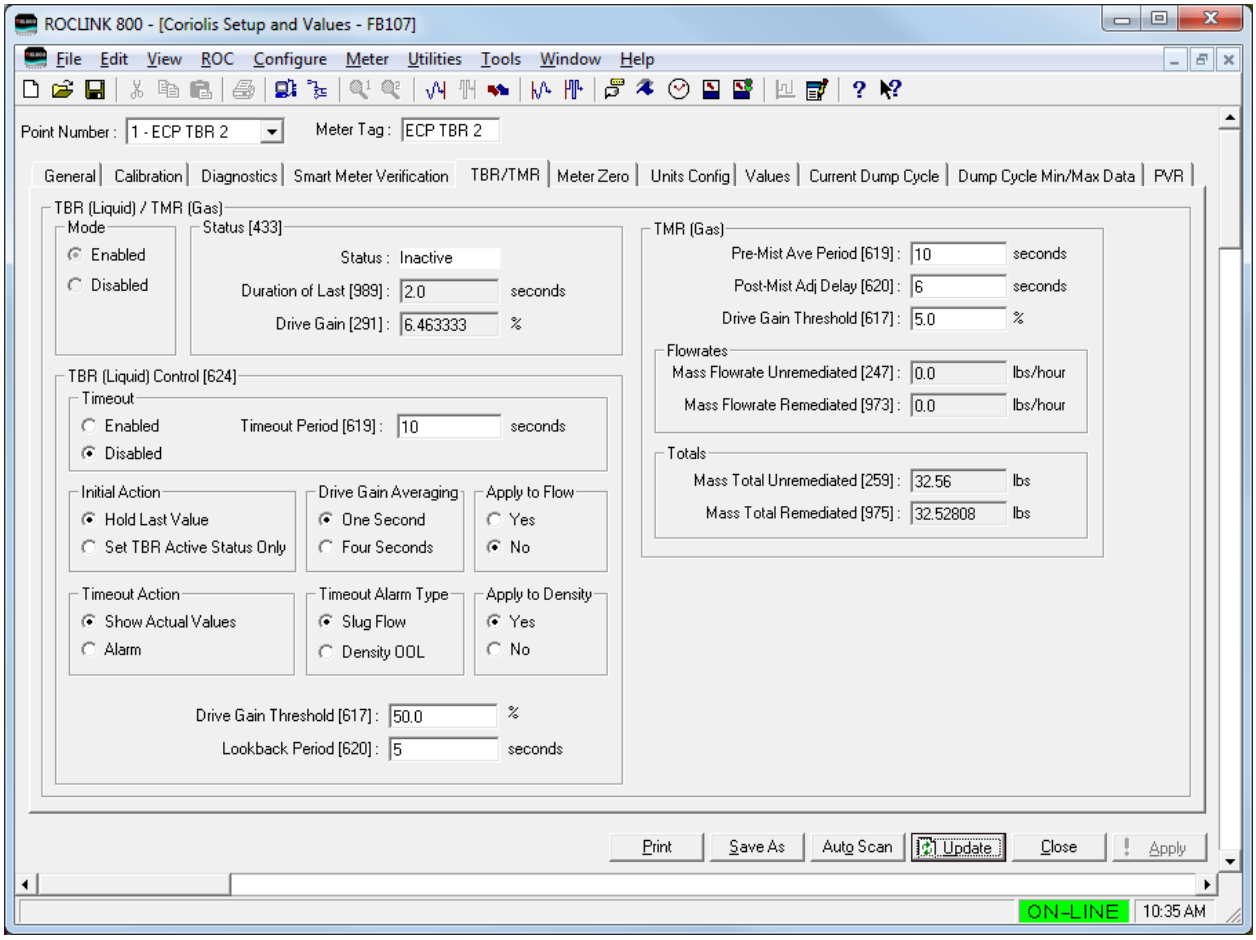

Figure 10. Coriolis Setup and Values – TBR/TMR Tab

2. Review—and change as necessary—the values in the following

fields:

Field	Description
Mode	Indicates whether TBR or TMR is enabled on the selected meter.
Status	This **read-only** field shows the TBR or TMR status for the selected meter (if the option is activated).
Duration of Last	This **read-onl**y field shows the number of seconds for the last recorded TBR or TMR event.
Drive Gain	This **read-only** field shows current drive gain value, in percent, retrieved from the selected meter.
TBR (Liquid) Control	
Timeout	Sets, in seconds, the amount of time the module holds the last measured value after first detecting a bubble.
Timeout Period	Sets, in seconds, the amount of time the module holds the last measured value after first detecting a bubble. Valid values range from **10** to **30,000** seconds. The default is **10 seconds**.
Initial Action	Indicates whether the module holds the last measured density value from the time period before transient bubbles were detected. The **Set TBR Active Status Only** option allows for the indication of transient bubbles, but takes no action. Default is **Hold Last Value**.
Drive Gain Averaging	Sets the number of seconds during which the module determines the average drive gain. Default is **1 Second**.
Apply to Flow	Determines if the TBR event affects the mass flow rate and accumulation. Default is **Yes**.
Timeout Action	Sets the behavior of the selected meter when the defined number of seconds in the timeout period has passed and the TBR event is still active. Default is **Show Actual Values**.
Timeout Alarm Type	Determines the type of alarm that the module triggers in the event of TBR timeout. Valid values are **Slug Flow** or **Density OOL** (out of limits). Default is **Slug Flow**. **Note**: You must also set the Timeout Action option to **Alarm**.
Apply to Density	Determines if the TBR event modifies the density calculations. Default is **Yes**
Drive Gain Threshold	Sets the Drive Gain percentage **above** which the system initiates a TBR event. The default is **1.8**.

Field	Description
Lookback Period	Sets the number of seconds back in time from which the program calculates the last measured value (LMV) for density. Valid values range from **5** to **30** seconds. Default is **0**.
TMR (Gas)	
Pre-Mist Ave Period	Defines, in seconds, the application goes back in time to determine the density to use in TMR remediation.
Post-Mist Adj Delay	Defines, in seconds, how long the application waits before beginning density adjustments due to TMR.
Drive Gain Threshold	Sets the Drive Gain percentage that triggers a TMR event. The default is **1.8**.
Mass Flowrate Unremediated	This **read-only** field shows the mixture's unremediated mass flow rate.
Mass Flowrate Remediated	This **read-only** field shows the mixture's remediated mass flow rate. When used with gas meter runs on the ROC800/ROC800L or FB107, use this value as the flow rate input.
Mass Total Unremediated	This **read-only** field shows the mixture's unremediated accumulated mass total.
Mass Total Remediated	This **read-only** field shows the mixture's remediated accumulated mass total. When used with gas meter runs on the ROC800/ROC800L or FB107, use this value as the accumulator input.

3. Click **Apply** to save any changes you have made to this screen.
4. Proceed to *Section 3.1.5* to configure the Meter Zero tab.

3.1.6 Coriolis Setup and Values – Meter Zero

Note: Before you activate the zeroing process, shut off the meter's flow and block the meter with valves to isolate any pulsations from the line. Refer to the appropriate Micro Motion calibration procedures.

Zeroing the meter establishes a baseline for process measurement, by analyzing the sensor's output when there is no flow through the sensor tubes.

Use this screen to perform the meter zero process for the selected Coriolis meter. To access this screen:

1. Select the **Meter Zero** tab. The Meter Zero screen displays:

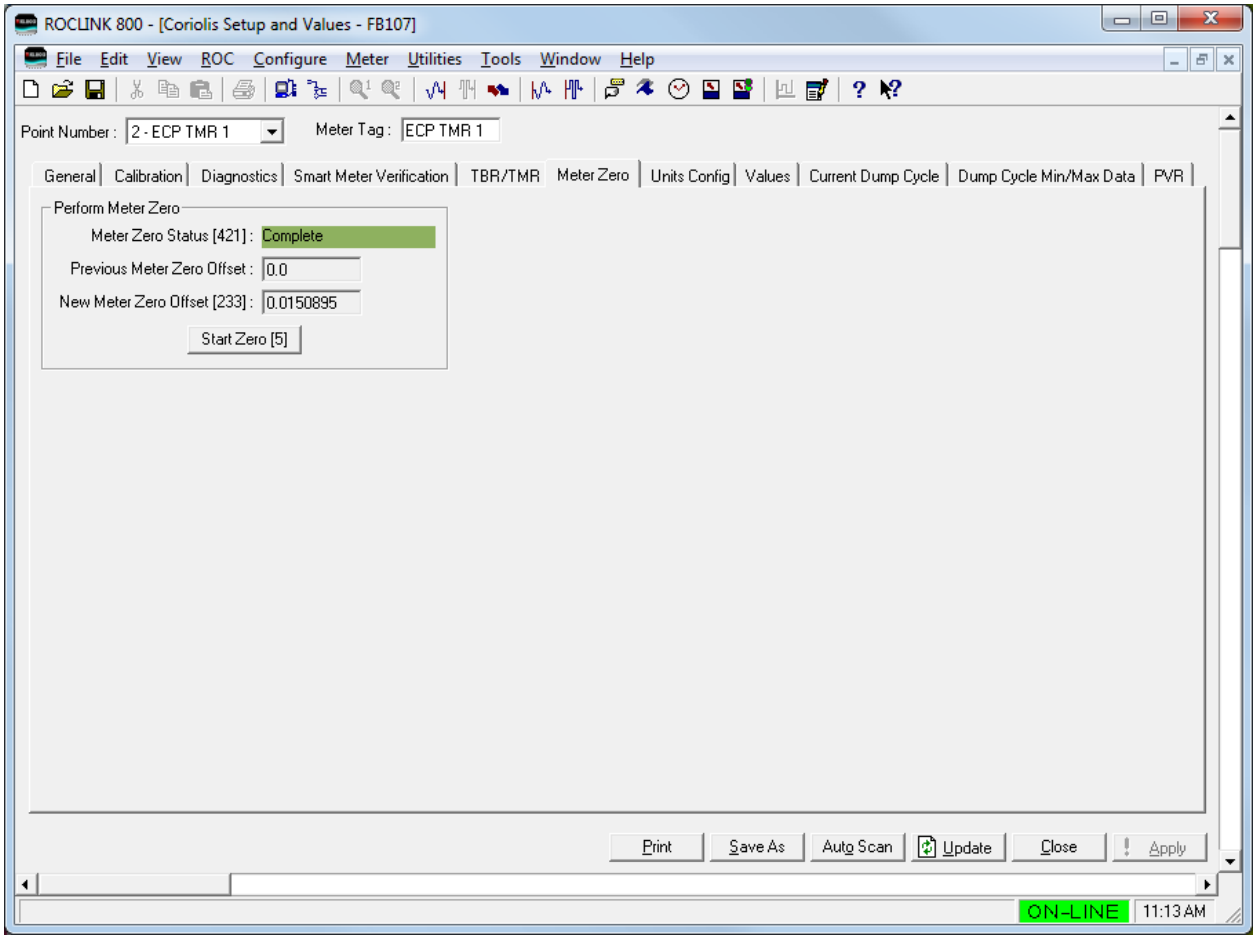
ROCLINK 800 - [Coriolis Setup and Values - FB107]
File Edit View ROC Configure Meter Utilities Tools Window Help
Point Number : 2 - ECP TMR 1
Meter Tag : ECP TMR 1
General Calibration Diagnostics Smart Meter Verification TBR/TMR Meter Zero Units Config Values Current Dump Cycle Dump Cycle Min/Max Data PVR
Perform Meter Zero
Meter Zero Status [421] : Complete
Previous Meter Zero Offset : 0.0
New Meter Zero Offset [233] : 0.0150895
Start Zero [5]
Print Save As Auto Scan Update Close Apply
ON-LINE
11:13 AM

Figure 11. Coriolis Setup and Values – Meter Zero Tab

2. Review—and change as necessary—the values in the following fields:

Field	Description
Meter Zero Status	This **read-only** field shows the current status of the meter zero procedure. Valid values are Complete; In Progress; Zeroing failed, Zero too low; Zeroing failed, Zero too high; and Zeroing failed, zero too noisy.
Previous Meter Zero Offset	This **read-only** field shows the value of the meter zero offset as determined by the previous meter zero procedure.
New Meter Zero Offset	This **read-only** field shows the value of the meter zero offset as determined by the most recent meter zero procedure.
Start Zero	Click to begin the meter zero procedure.

3. Proceed to *Section 3.1.7* to configure the Units Configuration tab.

3.1.7 Coriolis Setup and Values – Units Configuration

Use this screen to configure the units used for the selected Coriolis meter. To access this screen:

1. Select the **Units Configuration** tab. The Unit Configuration screen displays:

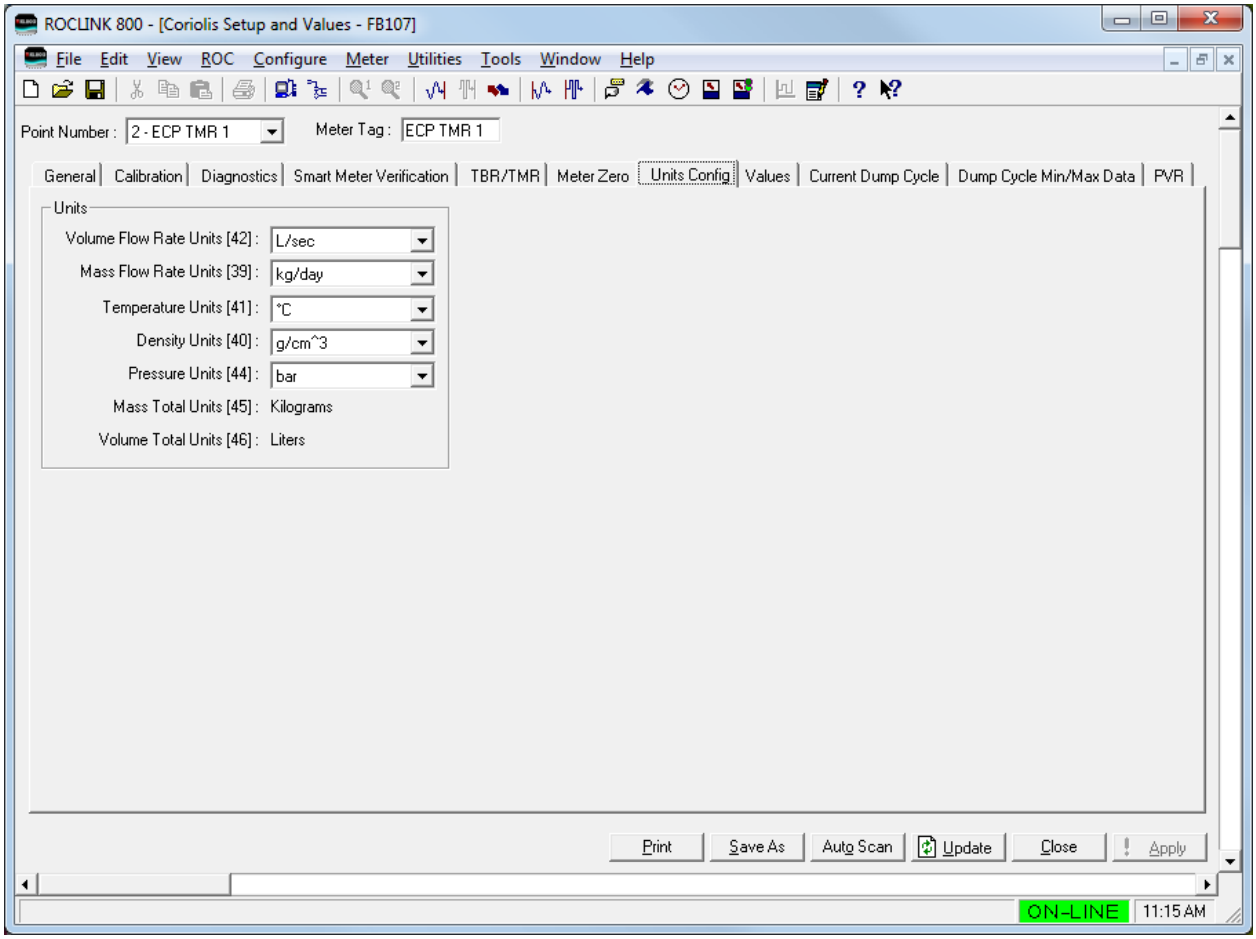
ROCLINK 800 - [Coriolis Setup and Values - FB107]
File Edit View ROC Configure Meter Utilities Tools Window Help
Point Number : 2 - ECP TMR 1
Meter Tag : ECP TMR 1
General Calibration Diagnostics Smart Meter Verification TBR/TMR Meter Zero Units Config Values Current Dump Cycle Dump Cycle Min/Max Data PVR
Units
Volume Flow Rate Units [42] : L/sec
Mass Flow Rate Units [39] : kg/day
Temperature Units [41] : °C
Density Units [40] : g/cm^3
Pressure Units [44] : bar
Mass Total Units [45] : Kilograms
Volume Total Units [46] : Liters
Print Save As Auto Scan Update Close Apply
ON-LINE
11:15 AM

Figure 12. Coriolis Setup and Values – Units Config Tab

2. Review—and change as necessary—the values in the following fields:

Field	Description
Volume Flow Rate Units	Sets the unit of volume flow rate for the selected meter. Click ▼ to display all defined options. **Note:** If you change this value, the module resets and clears **all** totals. No conversion of units occurs.

Field	Description
Mass Flow Rate Units	Sets the unit of mass flow rate for the selected meter. Click ▼ to display all defined options. **Note:** If you change this value, the module resets and clears **all** totals. No conversion of units occurs.
Temperature Units	Sets the unit of temperature for the selected meter. Click ▼ to display all defined options.
Density Units	Sets the unit of density for the selected meter. Click ▼ to display all defined options.
Pressure Units	Sets the unit of pressure for the selected meter. Click ▼ to display all defined options.
Mass Total Units	This **read-only** field shows the Mass Total Units of the selected meter. The units are determined from Mass units selected above without a time base. Note that units differ when measuring liquids as compared to gas. Select units accordingly.
Volume Total Units	This **read-only** field shows the Volume Total Units of the Coriolis meter. The Volume units are determined from the selections above without a time base.

3. Click **Apply** to save any changes you have made to this screen.
4. Proceed to *Section 3.1.8* to configure the Values tab.

3.1.8 Coriolis Setup and Values – Values

Use this screen to view the total accumulated volume and mass values for the selected Coriolis meter.

Note: The Values screen shown in *Figure 13* is a composite. It is **only** an example for documentation purposes and **would never** occur in a live system.

To access this screen:

1. Select the **Values** tab. The Values screen displays.

Note:

- The displayed fields on this screen depend on the values you select for *Meter Mode* and *Flow Direction Mode* in the General Tab.
- The totals shown on the Values tab are based on the specified contract hour. These totals are independent from the Force End of Day selection (**ROC** > **Information**), and are **not updated** when you perform a Force End of Day.

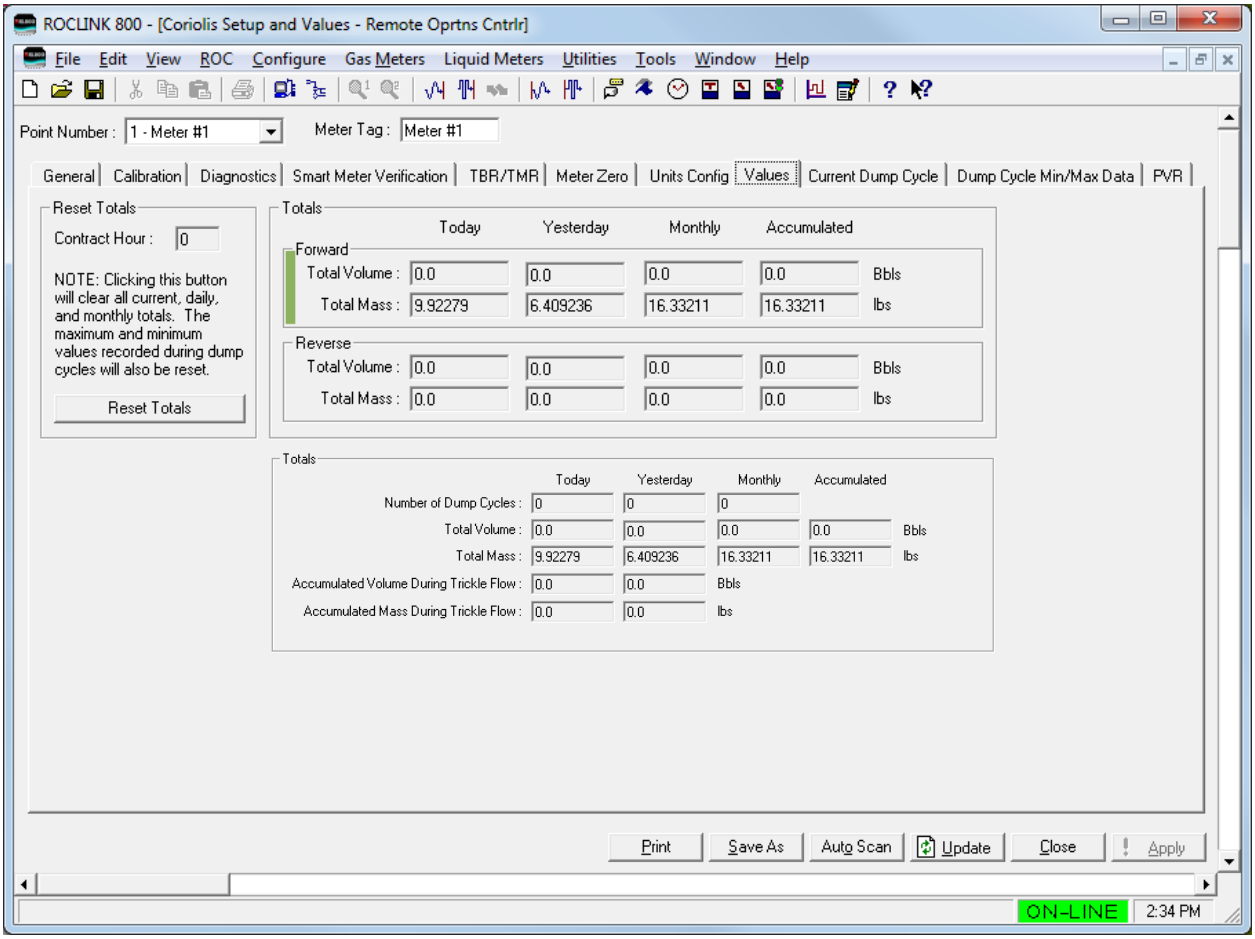
ROCLINK 800 - [Coriolis Setup and Values - Remote Oprtns Cntrlr]
File Edit View ROC Configure Gas Meters Liquid Meters Utilities Tools Window Help
Point Number : 1 - Meter #1
Meter Tag : Meter #1
General Calibration Diagnostics Smart Meter Verification TBR/TMR Meter Zero Units Config Values Current Dump Cycle Dump Cycle Min/Max Data PVR
Reset Totals
Contract Hour : 0
NOTE: Clicking this button will clear all current, daily, and monthly totals. The maximum and minimum values recorded during dump cycles will also be reset.
Reset Totals
Totals
Today Yesterday Monthly Accumulated
Forward
Total Volume : 0.0 0.0 0.0 0.0 Bbls
Total Mass : 9.92279 6.409236 16.33211 16.33211 lbs
Reverse
Total Volume : 0.0 0.0 0.0 0.0 Bbls
Total Mass : 0.0 0.0 0.0 0.0 lbs
Totals
Today Yesterday Monthly Accumulated
Number of Dump Cycles : 0 0 0
Total Volume : 0.0 0.0 0.0 0.0 Bbls
Total Mass : 9.92279 6.409236 16.33211 16.33211 lbs
Accumulated Volume During Trickle Flow : 0.0 0.0 Bbls
Accumulated Mass During Trickle Flow : 0.0 0.0 lbs
Print Save As Auto Scan Update Close Apply
ON-LINE 2:34 PM

Figure 13. Coriolis Setup and Values – Values Tab

2. Review the values in the following fields:

Field	Description
Reset Totals	
Contract Hour	This **read-only** field shows the contract hour as configured on the **ROC** > **Information** screen.
Reset Totals	Click to clear **all** totals and reset all minimum and maximum values stored in the module.
Totals *(Forward Only, Reverse Only, Bi-Directional)*	
Forward Total Volume	These **read-only** fields show the volumes accumulated in the current contract day (Today), in the previous contract day (Yesterday), and in the current month (Monthly). The value in the Accumulated field provides a running total for all dump cycles, is updated after the completion of a dump cycle and during trickle flow, and rolls over at 1,000,000 units. Configure units using the Units Configuration tab. Once the contract day is over, the value in the Today field resets to zero, and the last value recorded by the meter becomes the value of the Yesterday Total Volume field. **Note**: These fields display **only** if you select **Continuous** as the Meter Mode and either **Forward Only** or **Bi-Directional** as the Flow Direction Mode on the General tab.
Forward Total Mass	These **read-only** fields show the mass accumulated in the current contract day (Today), in the previous contract day (Yesterday), and in the current month (Monthly). The value in the Accumulated field provides a running total for all dump cycles, is updated after the completion of a dump cycle and during trickle flow, and rolls over at 1,000,000 units Configure units using the Units Configuration tab. Once the contract day is over, the value in the Today field resets to zero, and the last value recorded by the meter becomes the value of the Yesterday Total Volume field. **Note**: These fields display **only** if you select **Dump Cycle** as the Meter Mode and either **Forward Only** or **Bi-Directional** as the Flow Direction Mode on the General tab.

Field	Description
Reverse Total Volume	These **read-only** fields show the volumes accumulated in the current contract day (Today), in the previous contract day (Yesterday), and in the current month (Monthly). The value in the Accumulated field provides a running total for all dump cycles, is updated after the completion of a dump cycle and during trickle flow, and rolls over at 1,000,000 units. Configure units using the Units Configuration tab. Once the contract day is over, the value in the Today field resets to zero, and the last value recorded by the meter becomes the value of the Yesterday Total Volume field. **Note**: These fields display **only** if you select **Continuous** as the Meter Mode and either **Reverse Only** or **Bi-Directional** as the Flow Direction Mode on the General tab.
Reverse Total Mass	These **read-only** fields show the mass accumulated in the current contract day (Today), in the previous contract day (Yesterday), and in the current month (Monthly). The value in the Accumulated field provides a running total for all dump cycles, is updated after the completion of a dump cycle and during trickle flow, and rolls over at 1,000,000 units. Configure units using the Units Configuration tab. Once the contract day is over, the value in the Today field resets to zero, and the last value recorded by the meter becomes the value of the Yesterday Total Volume field. **Note**: These fields display **only** if you select **Dump Cycle** as the Meter Mode and either **Reverse Only** or **Bi-Directional** as the Flow Direction Mode on the General tab.
Totals *(**Dump Cycle** selected as Meter Mode on General tab)*	
Number of Dump Cycles	These **read-only** fields show the number of dump cycles that have occurred in the current contract day (Today), in the previous contract day (Yesterday), and for the current month (Monthly). **Note**: These fields display **only** if you select **Dump Cy**cle as the Meter Mode on the General tab.

Field	Description
Total Volume	These **read-only** fields show the volumes accumulated in the current contract day (Today), in the previous contract day (Yesterday), and in the current month (Monthly). The value in the Accumulated field provides a running total for all dump cycles, is updated after the completion of a dump cycle and during trickle flow, and rolls over at 1,000,000 units. Configure units using the Units Configuration tab. Once the contract day is over, the value in the Today field resets to zero, and the last value recorded by the meter becomes the value of the Yesterday Total Volume field. **Note**: These fields display **only** if you select **Dump Cyc**le as the Meter Mode on the General tab.
Total Mass	These **read-only** fields show the mass accumulated in the current contract day (Today), in the previous contract day (Yesterday), and in the current month (Monthly). The value in the Accumulated field provides a running total for all dump cycles, is updated after the completion of a dump cycle and during trickle flow, and rolls over at 1,000,000 units. Configure units using the Units Configuration tab. Once the contract day is over, the value in the Today field resets to zero, and the last value recorded by the meter becomes the value of the Yesterday Total Volume field. **Note**: These fields display **only** if you select **Dump Cyc**le as the Meter Mode on the General tab.
Accumulated Volume During Trickle Flow	These **read-only** fields show the volume accumulated while the meter was not in a dump cycle for the current (Today) contract day and for the previous contract day (Yesterday). The program updates these values whenever a dump cycle is not in progress. Rollover occurs at 1,000,000. Configure units using the Units Configuration tab. **Note**: These fields display **only** if you select **Dump Cyc**le as the Meter Mode on the General tab.

Field	Description
Accumulated Mass During Trickle Flow	These **read-only** fields show the mas accumulated while the meter was not in a dump cycle for the current (Today) contract day and for the previous contract day (Yesterday). The program updates these values whenever a dump cycle is not in progress. Rollover occurs at 1,000,000. Configure units using the Units Configuration tab. **Note**: These fields display **only** if you select **Dump Cyc**le as the Meter Mode on the General tab.

3. Proceed to *Section 3.1.9* to configure the Current Dump Cycle tab.

3.1.9 Coriolis Setup and Values – Current Dump Cycle

Note: This screen is available **only** if you select **Dump Cycle** as the Meter Mode on the General tab. Dump Cycle mode applies **only** to liquid flow.

Use this screen to view the current dump cycle information for the selected Coriolis meter. To access this screen:

1. Select the **Current Dump Cycle** tab. The Current Dump Cycle screen displays:

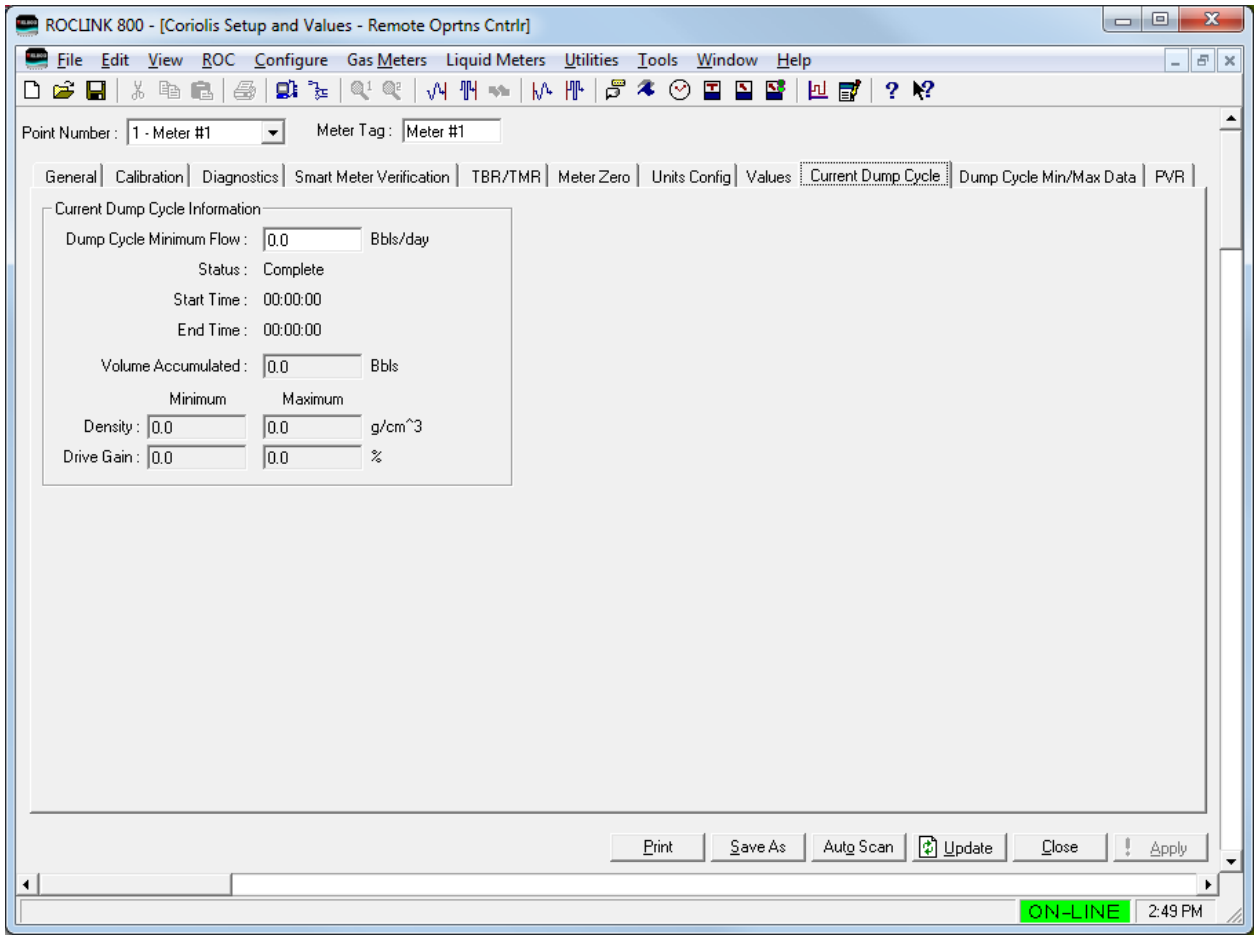
ROCLINK 800 - [Coriolis Setup and Values - Remote Oprtns Cntrlr]
File Edit View ROC Configure Gas Meters Liquid Meters Utilities Tools Window Help
Point Number : 1 - Meter #1
Meter Tag : Meter #1
General Calibration Diagnostics Smart Meter Verification TBR/TMR Meter Zero Units Config Values Current Dump Cycle Dump Cycle Min/Max Data PVR
Current Dump Cycle Information
Dump Cycle Minimum Flow : 0.0 Bbls/day
Status : Complete
Start Time : 00:00:00
End Time : 00:00:00
Volume Accumulated : 0.0 Bbls
Minimum Maximum
Density : 0.0 0.0 g/cm^3
Drive Gain : 0.0 0.0 %
Print Save As Auto Scan Update Close Apply
ON-LINE 2:49 PM

Figure 14. Coriolis Setup and Values – Current Dump Cycle Tab

2. Review—and change as necessary—the values in the following fields:

Field	Description
Dump Cycle Minimum Flow	Sets the minimum flow rate for a dump cycle. If flow is less than this value, the module assumes the dump cycle is closed and trickle flow accumulation is in effect.

Field	Description
Status	This **read-only** field shows the current status of a dump cycle. Valid values are **Complete** and **In Progress**.
Start Time	This **read-only** field shows the start time of the current (in progress) dump cycle.
End Time	This **read-only** field shows the end time of either the current (in progress) or the most recently completed dump cycle.
Volume Accumulated	This **read-only** field shows the volume accumulated during either the current (in progress) or the most recently completed dump cycle. Configure units using the Units Configuration tab.
Density	These **read-only** fields show the minimum and maximum density during either the current (in progress) or the most recently completed dump cycle. Configure units using the Units Configuration tab.
Drive Gain	These **read-only** fields show, in percent, the minimum and maximum drive gain during either the current (in progress) or the most recently completed dump cycle.

3. Click **Apply** to save any changes you have made to this screen.
4. Proceed to *Section 3.1.10* to configure the Dump Cycle Min/Max Data tab.

3.1.10 Coriolis Setup and Values – Dump Cycle Min/Max Data

Note: This screen is available **only** if you select **Dump Cycle** as the Meter Mode on the General tab.

Use this screen to view density and drive gain minimum and maximum values, cycle start and end times, and volume rates for the selected Coriolis meter. To access this screen:

1. Select the **Dump Cycle Min/Max Data** tab. The Dump Cycle Min/Max Data screen displays:

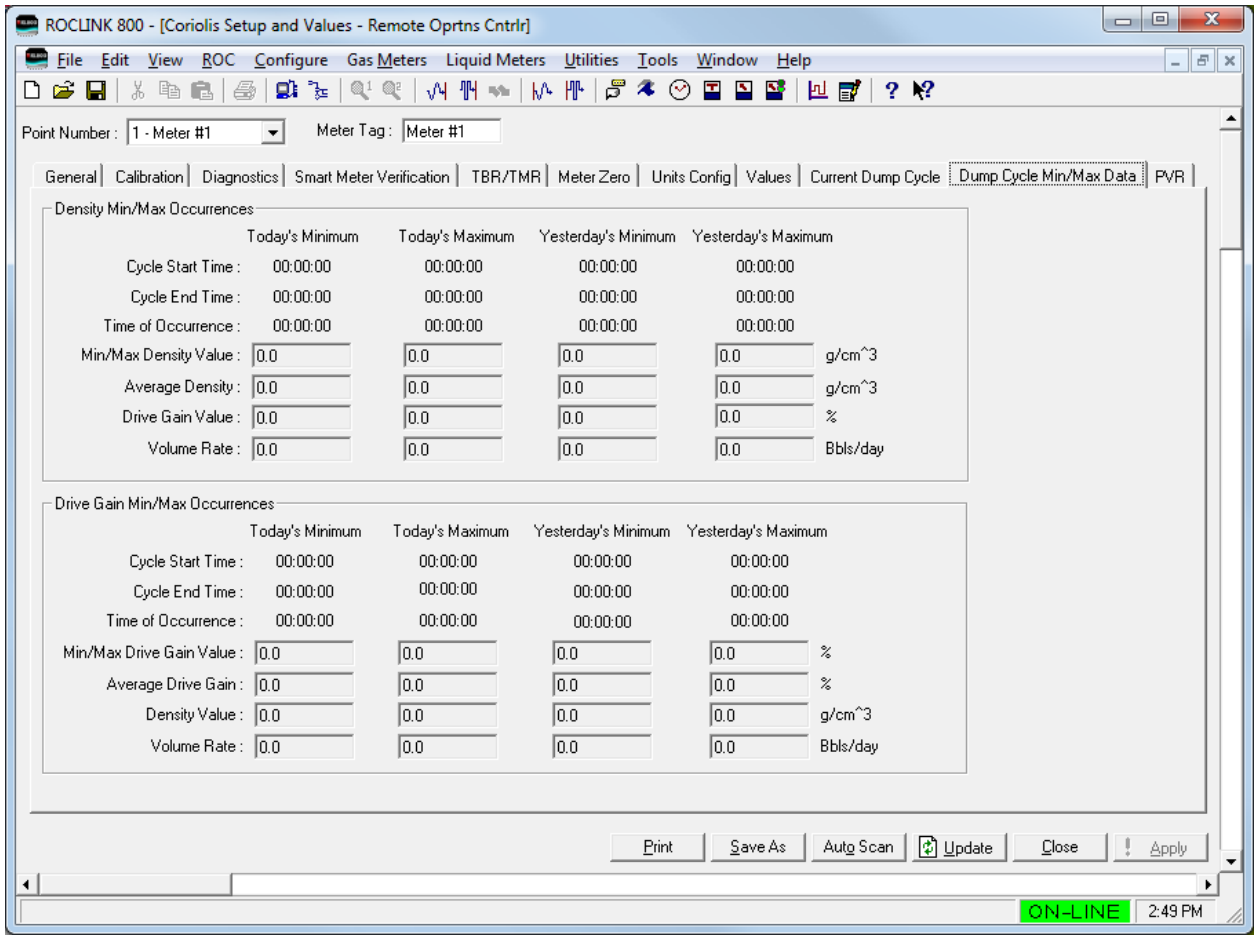
ROCLINK 800 - [Coriolis Setup and Values - Remote Oprtns Cntrlr]
File Edit View ROC Configure Gas Meters Liquid Meters Utilities Tools Window Help
Point Number : 1 - Meter #1
Meter Tag : Meter #1
General Calibration Diagnostics Smart Meter Verification TBR/TMR Meter Zero Units Config Values Current Dump Cycle Dump Cycle Min/Max Data PVR
Density Min/Max Occurrences
Today's Minimum Today's Maximum Yesterday's Minimum Yesterday's Maximum
Cycle Start Time : 00:00:00 00:00:00 00:00:00 00:00:00
Cycle End Time : 00:00:00 00:00:00 00:00:00 00:00:00
Time of Occurrence : 00:00:00 00:00:00 00:00:00 00:00:00
Min/Max Density Value : 0.0 0.0 0.0 0.0 g/cm^3
Average Density : 0.0 0.0 0.0 0.0 g/cm^3
Drive Gain Value : 0.0 0.0 0.0 0.0 %
Volume Rate : 0.0 0.0 0.0 0.0 Bbls/day
Drive Gain Min/Max Occurrences
Today's Minimum Today's Maximum Yesterday's Minimum Yesterday's Maximum
Cycle Start Time : 00:00:00 00:00:00 00:00:00 00:00:00
Cycle End Time : 00:00:00 00:00:00 00:00:00 00:00:00
Time of Occurrence : 00:00:00 00:00:00 00:00:00 00:00:00
Min/Max Drive Gain Value : 0.0 0.0 0.0 0.0 %
Average Drive Gain : 0.0 0.0 0.0 0.0 %
Density Value : 0.0 0.0 0.0 0.0 g/cm^3
Volume Rate : 0.0 0.0 0.0 0.0 Bbls/day
Print Save As Auto Scan Update Close Apply
ON-LINE 2:49 PM

Figure 15. Coriolis Setup and Values – Dump Cycle Min/Max Data Tab

2. Review the values in the following fields:

Field	Description
Density Min/Max Occurrences	
Cycle Start Time	These **read-only** fields show the start time of the dump cycle in which the minimum and the maximum density values were recorded during the current and the previous contract day.

Field	Description
Cycle End Time	These **read-only** fields show the end time of the dump cycle in which the minimum and the maximum density values were recorded during the current and the previous contract day.
Time of Occurrence	These **read-only** fields show the time at which the minimum and the maximum density values were recorded during the current and the previous contract day.
Min/Max Density Value	These **read-only** fields show the minimum and the maximum density values recorded during the current and the previous contract day. Units are configured in the Units Configuration tab
Average Density	These **read-only** fields show the average density for the day at the moment when the minimum and the maximum density values were recorded during the current and the previous contract day. Units are configured in the Units Configuration tab.
Drive Gain Value	These **read-only** fields show, in percent, the drive gain value at the moment when the minimum and the maximum density values were recorded during the current and the previous contract day.
Volume Rate	These **read-only** fields show the volume rate at the moment when the minimum and the maximum density values were recorded during the current and the previous contract day. Units are configured in the Units Configuration tab.
Drive Gain Min/Max Occurrences	
Cycle Start Time	These **read-only** fields show the start time of the dump cycle in which the minimum and the maximum drive gain values were recorded during the current and the previous contract day.
Cycle End Time	These **read-only** fields show the end time of the dump cycle in which the minimum and the maximum drive gain values were recorded during the current and the previous contract day.
Time of Occurrence	These **read-only** fields show the time at which the minimum and the maximum drive gain values were recorded during the current and the previous contract day.
Min/Max Drive Gain Value	These **read-only** fields show, in percent, the minimum and the maximum drive gain values recorded during the current and the previous contract day.
Average Drive Gain	These **read-only** fields show, in percent, the average drive gain values recorded during the current and the previous contract day.

Field	Description
Density Value	These **read-only** fields show the density value at the moment when the minimum and the maximum drive gain values were recorded during the current and the previous contract day. Configure units using the Units Configuration tab.
Volume Rate	These **read-only** fields show the volume rate at the moment when the minimum and the maximum drive gain values occurred during the current and the previous contract day. Configure units using the Units Configuration tab.

3. Proceed to *Section 3.1.11* to configure the PVR tab.

3.1.11 Coriolis Setup and Values – PVR

This screen displays only if the connected Micro Motion Coriolis device has the factory-enabled production volume reconciliation (PVR) feature. Otherwise the message *Feature not supported on this Micro Motion meter* displays.

Use this screen to configure PVR parameters and view PVR-related flow rates and totals. To access this screen:

1. Select the **PVR** tab. The PVR screen displays:

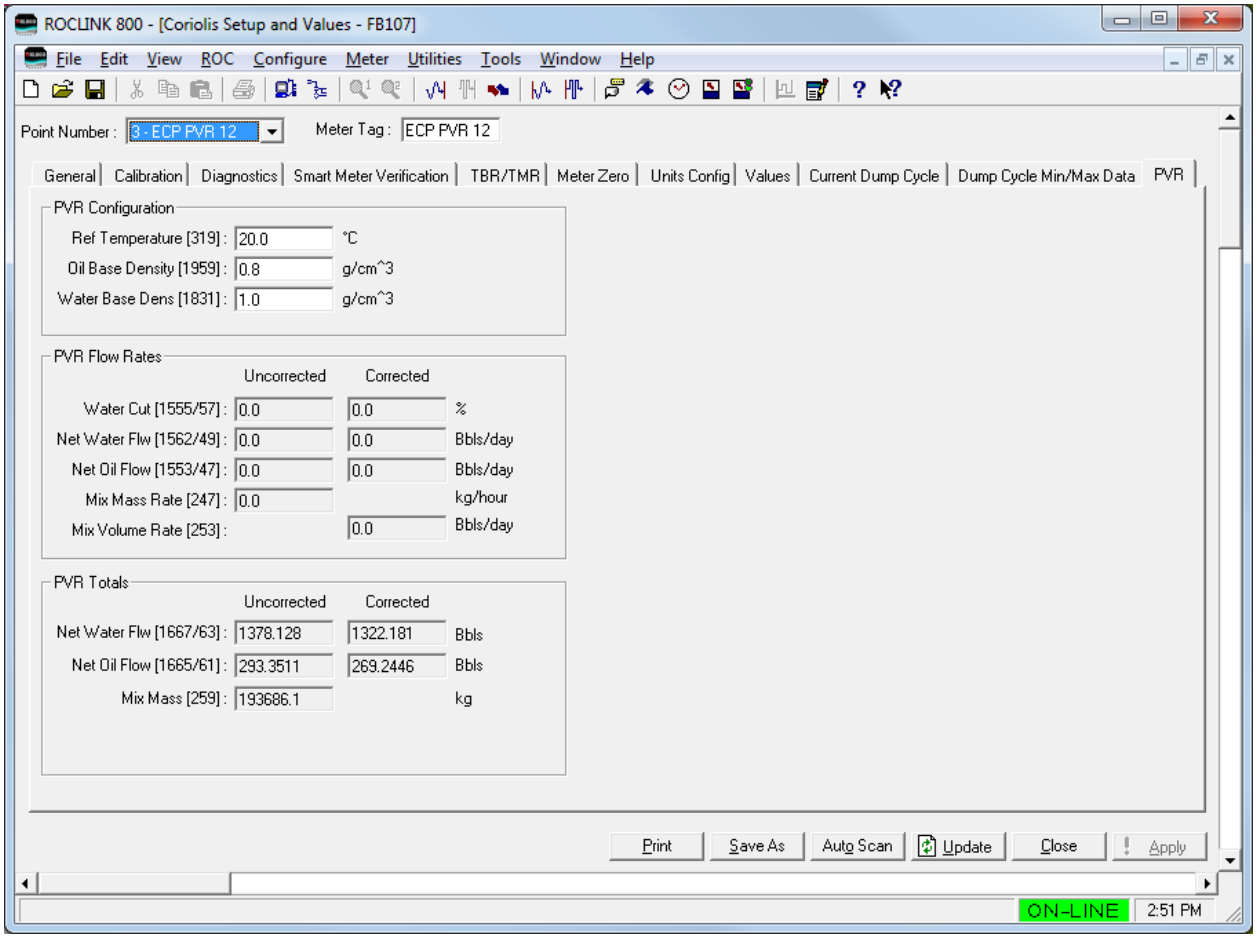
ROCLINK 800 - [Coriolis Setup and Values - FB107]
File Edit View ROC Configure Meter Utilities Tools Window Help
Point Number : 3 - ECP PVR 12
Meter Tag : ECP PVR 12
General Calibration Diagnostics Smart Meter Verification TBR/TMR Meter Zero Units Config Values Current Dump Cycle Dump Cycle Min/Max Data PVR
PVR Configuration
Ref Temperature [319] : 20.0 °C
Oil Base Density [1959] : 0.8 g/cm^3
Water Base Dens [1831] : 1.0 g/cm^3
PVR Flow Rates
Uncorrected Corrected
Water Cut [1555/57] : 0.0 0.0 %
Net Water Flw [1562/49] : 0.0 0.0 Bbls/day
Net Oil Flow [1553/47] : 0.0 0.0 Bbls/day
Mix Mass Rate [247] : 0.0 kg/hour
Mix Volume Rate [253] : 0.0 Bbls/day
PVR Totals
Uncorrected Corrected
Net Water Flw [1667/63] : 1378.128 1322.181 Bbls
Net Oil Flow [1665/61] : 293.3511 269.2446 Bbls
Mix Mass [259] : 193686.1 kg
Print Save As Auto Scan Update Close Apply
ON-LINE 2:51 PM

Figure 16. Coriolis Setup and Values – PVR Tab

Note: Unit values on this screen are dynamic, and reflect the values defined on the Units Config tab.

2. Review the values in the following fields:

Field	Description
PVR Configuration	
Ref Temperature	Sets the temperature to which "corrected" flowrates and totals have been corrected, typically 60 °F or 15 °C.

Field	Description
Oil Base Density	Sets the density of "dry" oil at base conditions. The module uses this value to calculate the water cut and determine the percentage of oil versus water in the stream. Value is obtained from a petroleum analysis laboratory or an external calculation routine.
Water Base Dens	Sets the density of produced water at base conditions. The module uses this value to calculate the water cut and determine the percentage of oil versus water in the stream. Value is obtained from a petroleum analysis laboratory or an external calculation routine.
PVR Flow Rates	
Water Cut	These **read-only** fields show the calculated water cut (percentage), where 100% is pure produced water and 0% is pure oil.
Net Water Flw	These **read-only** fields show the volume flow rate of the water.
Net Oil Flow	These **read-only** fields show the mass flow rate of the liquid mixture, unremediated by PVR.
Mix Mass Rate	This **read-only** field shows the mass flow rate of the liquid mixture, remediated for PVR.
Mix Volume Rate	This **read-only** field shows the volume flow rate of the mixture, remediated by PVR.
PVR Totals	
Net Water Flw	These **read-only** fields show the net volume accumulation of the water. The uncorrected value is at line (flowing) conditions, and the corrected value is at reference temperature conditions.
Net Oil Flow	These **read-only** fields show the net volume total accumulation of the oil. The uncorrected value is at line (flowing) conditions, and the corrected value is at reference temperature conditions.
Mix Mass	This **read-only** field shows the mass accumulated total of the mixture, unremediated for PVR.

3. Click **Close** to return to the ROCLINK 800 screen. Proceed to *Section 3.2* to save your configuration.

3.2 Saving the Configuration

Whenever you modify or change the configuration, it is a good practice to save the final configuration to memory. To save the configuration:

1. Select **ROC** > **Flags**. The Flags screen displays:

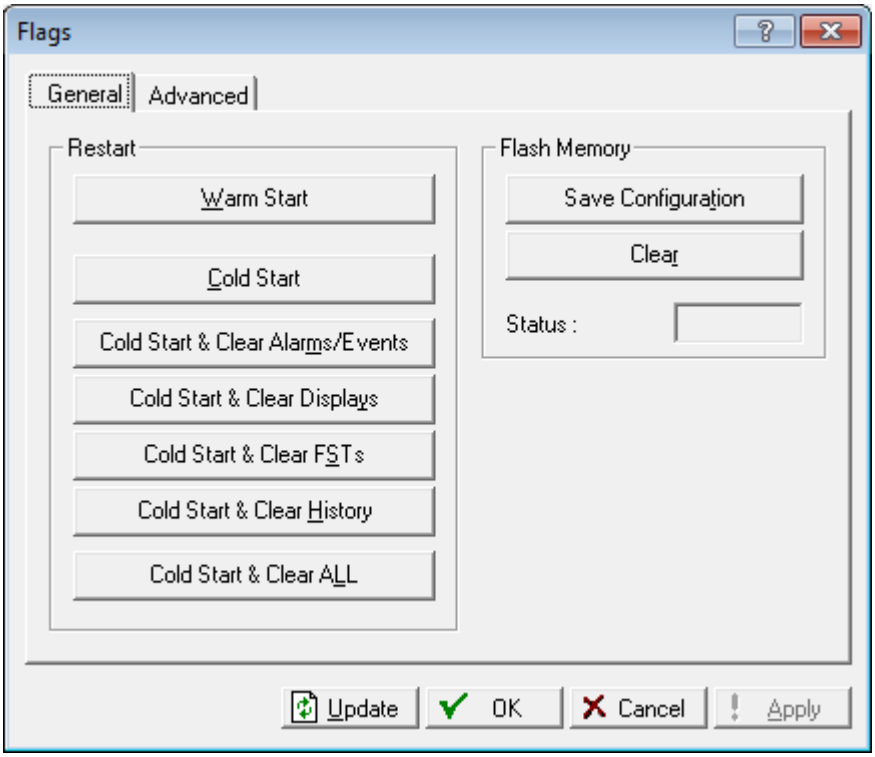

Figure 17. Flags screen

2. Click **Save Configuration**. A verification message displays:

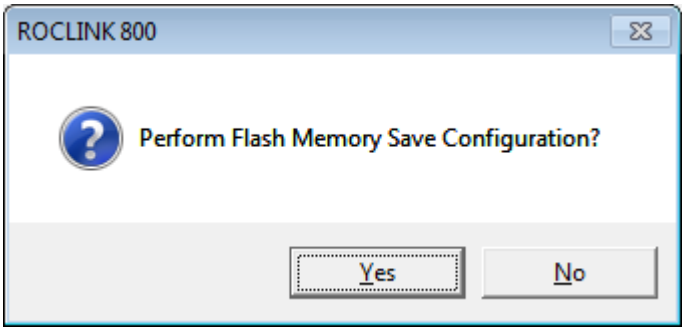

Figure 18. Perform screen

3. Click **Yes** to begin the save process. The Status field on the Flags screen displays *In Progress*. When the process completes, the following message displays:

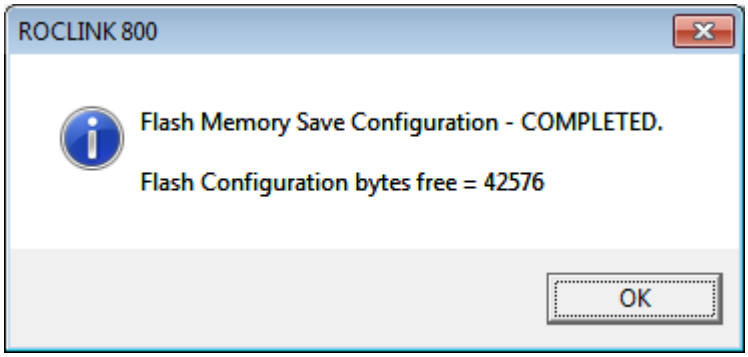

Figure 19. Save Confirmation

4. Click **OK**. The Status field on the Flags screen displays *Completed*.
5. Click **Update** on the Flags screen. This completes the process of saving your new configuration.

Note: For archive purposes, you should also save this configuration to your PC's hard drive or a removable media (such as a flash drive) using the **File > Save Configuration** option on the ROCLINK 800 menu bar.

Chapter 4 – Reference Materials

This section provides tables of information on the point types the MMI Coriolis Interface module uses.

- Point Type 65 (for the FB107) or Point Type 244 (for the ROC800/ROC800L)

4.1 Point Type 65/244: Micro Motion Coriolis Interface Module

Point type 65 (for FB107) or point type 244 (for ROC800/ROC800L) contains the parameters for configuring the Coriolis Interface Application module. The FB107 supports four logicals of this point type, corresponding to the four meter runs the FB107 supports; the ROC800/ROC800L supports six logicals, corresponding to the six meter runs the ROC800/ROC800L supports.

Point Type 65/244: Coriolis Interface Application Module

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
0	Point Tag ID	R/W	User	AC	10	0x20 → 0x7E for each ASCII character	Logical 0 = “Meter #1“, Logical 1 = “Meter #2”, Logical 2 = “Meter #3”, Logical 3 = “Meter #4” For ROC800: Logical 4 = Meter #5 Logical 5 = Meter #6	1.00	Point Type Description
1	Coriolis Modbus Address	R/W	User	UINT8	1	1 → 15, 32 → 47, 64 → 79, 96 → 110	255	1.00	Modbus address of the target Coriolis meter. Note this address cannot be changed to a value that is in use by another logical instance.
2	Polling Enable	R/W	User	UINT8	1	0-1	0	1.00	Enable communication with the target Coriolis meter. 0 = Polling Disabled 1 = Polling Enabled
3	Number of Retries	R/W	User	UINT8	1	0-255	3	1.00	The number of times communication with a Coriolis meter will be retried before a response timeout in the Comm Status parameter is set.
4	Poll Timeout	R/W	User	FL	4	0.5-15.0	1.0	1.00	Poll timeout
5	Actual Poll Period	R/O	System	FL	4	Any positive floating point number	0	1.00	The time between polls to a meter in seconds.

Point Type 65/244: Coriolis Interface Application Module

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
6	Comm Status	R/O	System	UINT8	1	0-10	0	1.00	Current communication status with the target meter. 0 = Communication Disabled 1 = Communicating 2 = Configuring Slot Registers 3 = Retrying 4 = Response Timeout 5 = Invalid CRC 6 = Invalid Response Format 7 = Slot Register Configuration Failed 8 = Slow Poll Mode 9 = Reset Totals Failed 10 = Incompatible target device firmware version **Note**: "Slow poll mode" occurs when the module's poll request fails, all retries are exhausted, and the device is not responding (which might occur if the connecting wire has been cut). In this case, the device automatically slows polling, shifting from a once-per-second poll sequence to a once-every-10-seconds poll sequence. Once the communication problem is resolved, normal polling resumes within 10 seconds.
7	Meter Status	R/O	System	UINT8	1	0-1	0	1.00	The current status of the Coriolis meter based on the primary Coriolis status register. 0 = No Failure 1 = Sensor Failure

Point Type 65/244: Coriolis Interface Application Module

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
8	Volume Low Flow Cutoff	R/W	User	FL	4	Any floating point number	0	1.00	The volume flow rate limit at which the flow rate should be considered as no flow. This value allows the module to identify the beginning and end of dump cycles. Volume accumulated below this cutoff, but above the Coriolis meter's low flow cutoff is considered to be trickle flow.
9	Live Volume Flow Rate	R/O	System	FL	4	Any positive floating point number	0	1.00	For **TBR**, the current volume flow rate retrieved from the meter. Rate units are determined based on the configuration of the meter.
	Live Volume Flow Rate	R/O	System	FL	4	Any positive floating point number	0	1.00	For **TMR**, the remediated volume flow rate retrieved from the meter. Rate units are determined based on the configuration of the meter.

Point Type 65/244: Coriolis Interface Application Module

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
10	Volume Flow Rate Units	R/W	System	UINT16	2	0, 15-253	0	1.00	Volume Flow Rate Units: 0 = Unknown 15 = Cubic feet/minute 16 = Gallons/minute 17 = Liters/minute 18 = Imperial gallons/minute 19 = Cubic meters/hour 22 = Gallons/second 23 = Mlllion U.S. gallons/day 24 = Liters/second 25 = Millions liters/day 26 = Cubic feet/second 27 = Cubic feet/day 28 = Cubic meters/second 29 = Cubic meters/day 30 = Imperial gallons/hour 31 = Imperial gallons/day 130 = Cubic feet/hour 131 = Cubic meters/minute 132 = Barrels/second 133 = Barrels/minute 134 = Barrels/hour 135 = Barrels/day 136 = U.S. gallons/hour 137 = Imperial gallons/second 138 = Liters/hour 253 = Special
11	Live Mass Flow Rate	R/O	System	FL	4	Any positive floating point number	0	1.00	For **TBR**, the current mass flow rate retrieved from the meter. Mass rate units are determined based on the configuration of the meter.
	Live Mass Flow Rate	R/O	System	FL	4	Any positive floating point number	0	1.00	For **TMR**, the unremeditated mass flow rate retrieved from the meter. Mass rate units are determined based on the configuration of the meter.

Point Type 65/244: Coriolis Interface Application Module

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
12	Mass Flow Rate Units	R/W	System	UINT16	2	0, 70-253	0	1.00	Mass Flow Rate Units: 0 = Unknown 70 = Grams/second 71 = Grams/minute 72 = Grams/hour 73 = Kilograms/second 74 = Kilograms/minute 75 = Kilograms/hour 76 = Kilograms/day 77 = Metric tons/minute 78 = Metric tons/hour 79 = Metric tons/day 80 = Pounds/second 81 = Pounds/minute 82 = Pounds/hour 83 = Pounds/day 84 = Short tons (2000 pounds)/minute 85 = Short tons (2000 pounds)/hour 86 = Short tons (2000 pounds)/day 87 = Long tons (2240 pounds)/hour 88 = Long tons (2240 pounds)/day 253 = Special
13	Live Sensor Temperature	R/O	System	FL	4	Any positive floating point number	0	1.00	Current Temperature value retrieved from the meter. Temperature units are determined based on the configuration of the meter.
14	Temperature Units	R/W	System	UINT16	2	0, 32-35	0	1.00	Temperature Units: 0 = Unknown 32 = Degrees C 33 = Degrees Fahrenheit 34 = Degrees Rankine 35 = Kelvin

Point Type 65/244: Coriolis Interface Application Module

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
15	Live Flowing Density	R/O	System	FL	4	Any positive floating point number	0	1.00	Current Density value retrieved from the meter. Density units are determined based on the configuration of the meter.
16	Density Units	R/W	System	UINT16	2	0, 90-104	0	1.00	Density Units: 0 = Unknown 90 = Specific gravity units 91 = Grams/cubic centimeter 92 = Kilograms/cubic meter 93 = Pounds/gallon 94 = Pounds/cubic foot 95 = Grams/milliliter 96 = Kilograms/liter 97 = Grams/liter 98 = Pounds/cubic inch 99 = Short tons (2000 pounds)/cubic yard 104 = Degrees API
17	Live Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	Current Drive Gain value retrieved from the meter. Drive Gain units are percent.
18	Dump Cycle Status	R/O	System	UINT8	1	0-1	0	1.00	The current status of a dump cycle. 0 = Complete 1 = In Progress
19	Current Dump Cycle Start Time	R/O	System	UINT32	4	0-235959	0	1.00	The start time of the current (in progress) or most recently completed dump cycle. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
20	Current Dump Cycle End Time	R/O	System	UINT32	4	0-235959	0	1.00	The end time of the current (in progress) or most recently completed dump cycle. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds

Point Type 65/244: Coriolis Interface Application Module

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
21	Current Dump Cycle Volume Accumulated	R/W	System	FL	4	Any positive floating point number	0	1.00	The volume accumulated during the current (in progress) or most recently completed dump cycle. Volume Total units are determined based on the configuration of the meter.
22	Current Dump Cycle Maximum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The maximum density during the current (in progress) or most recently completed dump cycle. Density units are determined based on the configuration of the meter.
23	Current Dump Cycle Maximum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The maximum drive gain during the current (in progress) or most recently completed dump cycle. Drive Gain units are percent.
24	Current Dump Cycle Minimum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The minimum density during the current (in progress) or most recently completed dump cycle. Density units are determined based on the configuration of the meter.
25	Current Dump Cycle Minimum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The minimum drive gain during the current (in progress) or most recently completed dump cycle. Drive Gain units are percent.
26	Today's Total Number of Dump Cycles	R/O	System	UINT16	2	0-65536	0	1.00	The number of dump cycles that have occurred in the current contract day.
27	Today's Total Accumulated Volume	R/W	System	FL	4	Any positive floating point number	0	1.00	The volume accumulated in the current contract day. Volume Total units are determined based on the configuration of the meter.

Point Type 65/244: Coriolis Interface Application Module

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
28	Volume Total Units	R/O	System	UINT16	2	0, 40-253	0	1.00	Volume Total Units: 0 = Unknown 40 = U.S. gallons 41 = Liters 42 = Imperial gallons 43 = Cubic Meters 46 = Barrels (42 U.S. gallons) 112 = Cubic feet 253 = Special
29	Today's Total Accumulated Mass	R/W	System	FL	4	Any positive floating point number	0	1.00	The mass accumulated in the current contract day. Mass Total units are determined based on the configuration of the meter.
30	Mass Total Units	R/O	System	UINT16	2	0, 60-253	0	1.00	Mass Total Units: 0 = Unknown 60 = Grams 61 = Kilograms 62 = Metric tons 63 = Pounds 64 = Short tons (2000 pounds) 65 = Long tons (2240 pounds) 253 = Special
31	Yesterday's Total Number of Dump Cycles	R/O	System	UINT16	2	0-65536	0	1.00	The number of dump cycles that have occurred in the previous contract day.
32	Yesterday's Total Accumulated Volume	R/W	System	FL	4	Any positive floating point number	0	1.00	The volume accumulated in the previous contract day. Volume units are determined based on the configuration of the meter.
33	Yesterday's Total Accumulated Mass	R/W	System	FL	4	Any positive floating point number	0	1.00	The mass accumulated in the previous contract day. Mass units are determined based on the configuration of the meter.
34	Monthly Total Number of Dump Cycle	R/O	System	UINT32	4	0-4294967295	0	1.00	The total number of dump cycles that have occurred during the current month
35	Monthly Total Accumulated Volume	R/W	System	FL	4	Any positive floating point number	0	1.00	The volume accumulated in the current month. Volume units are determined based on the configuration of the meter.

Point Type 65/244: Coriolis Interface Application Module

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
36	Monthly Total Accumulated Mass	R/W	System	FL	4	Any positive floating point number	0	1.00	The mass accumulated in the current month. Mass units are determined based on the configuration of the meter.
37	Today's Maximum Density Cycle Start Time	R/O	System	UINT32	4	0-235959	0	1.00	The start time of the dump cycle in which the maximum density value for the current contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
38	Today's Maximum Density Cycle End Time	R/O	System	UINT32	4	0-235959	0	1.00	The end time of the dump cycle in which the maximum density value for the current contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
39	Today's Maximum Density Time of Occurrence	R/O	System	UINT32	4	0-235959	0	1.00	The time at which the maximum density value for the current contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
40	Today's Maximum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The maximum density value recorded during the current contract day. Density units are determined based on the configuration of the meter.
41	Today's Average Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The average density value during active dump cycles recorded during the current contract day. Density units are determined based on the configuration of the meter.

Point Type 65/244: Coriolis Interface Application Module

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
42	Drive Gain at Today's Maximum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The drive gain value recorded when the maximum density value for the current contract day occurred. Drive gain units are percent.
43	Volume Rate at Today's Maximum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The volume rate recorded when the maximum density value for the current contract day occurred. Volume units are determined based on the configuration of the meter.
44	Today's Minimum Density Cycle Start Time	R/O	System	UINT32	4	0-235959	0	1.00	The start time of the dump cycle in which the minimum density value for the current contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
45	Today's Minimum Density Cycle End Time	R/O	System	UINT32	4	0-235959	0	1.00	The end time of the dump cycle in which the minimum density value for the current contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
46	Today's Minimum Density Time of Occurrence	R/O	System	UINT32	4	0-235959	0	1.00	The time at which the minimum density value for the current contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
47	Today's Minimum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The minimum density value recorded during the current contract day. Density units are determined based on the configuration of the meter.

Point Type 65/244: Coriolis Interface Application Module

Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
48	Drive Gain at Today's Minimum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The drive gain value recorded when the minimum density value for the current contract day occurred. Drive gain units are percent.
49	Volume Rate at Today's Minimum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The volume rate recorded when the minimum density value for the current contract day occurred. Volume units are determined based on the configuration of the meter.
50	Yesterday's Maximum Density Cycle Start Time	R/O	System	UINT32	4	0-235959	0	1.00	The start time of the dump cycle in which the maximum density value for the previous contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
51	Yesterday's Maximum Density Cycle End Time	R/O	System	UINT32	4	0-235959	0	1.00	The end time of the dump cycle in which the maximum density value for the previous contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
52	Yesterday's Maximum Density Time of Occurrence	R/O	System	UINT32	4	0-235959	0	1.00	The time at which the maximum density value for the previous contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
53	Yesterday's Maximum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The maximum density value recorded during the previous contract day. Density units are determined based on the configuration of the meter.

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
54	Yesterday's Average Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The average density value during active dump cycles recorded during the previous contract day. Density units are determined based on the configuration of the meter.
55	Drive Gain at Yesterday's Maximum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The drive gain value recorded when the maximum density value for the previous contract day occurred. Drive gain units are percent.
56	Volume Rate at Yesterday's Maximum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The volume rate recorded when the maximum density value for the previous contract day occurred. Volume units are determined based on the configuration of the meter.
57	Yesterday's Minimum Density Cycle Start Time	R/O	System	UINT32	4	0-235959	0	1.00	The start time of the dump cycle in which the minimum density value for the previous contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
58	Yesterday's Minimum Density Cycle End Time	R/O	System	UINT32	4	0-235959	0	1.00	The end time of the dump cycle in which the minimum density value for the previous contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
59	Yesterday's Minimum Density Time of Occurrence	R/O	System	UINT32	4	0-235959	0	1.00	The time at which the minimum density value for the previous contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
60	Yesterday's Minimum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The minimum density value recorded during the previous contract day. Density units are determined based on the configuration of the meter.
61	Drive Gain at Yesterday's Minimum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The drive gain value recorded when the minimum density value for the previous contract day occurred. Drive gain units are percent.
62	Volume Rate at Yesterday's Minimum Density	R/O	System	FL	4	Any positive floating point number	0	1.00	The volume rate recorded when the minimum density value for the previous contract day occurred. Volume units are determined based on the configuration of the meter.
63	Today's Maximum Drive Gain Cycle Start Time	R/O	System	UINT32	4	0-235959	0	1.00	The start time of the dump cycle in which the maximum drive gain value for the current contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
64	Today's Maximum Drive Gain Cycle End Time	R/O	System	UINT32	4	0-235959	0	1.00	The end time of the dump cycle in which the maximum drive gain value for the current contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
65	Today's Maximum Drive Gain Time of Occurrence	R/O	System	UINT32	4	0-235959	0	1.00	The time at which the maximum drive gain value for the current contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
66	Today's Maximum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The maximum drive gain value recorded during the current contract day. Drive gain units are percent.
67	Today's Average Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The average density value during active dump cycles recorded during the current contract day. Drive gain units are percent.
68	Density at Today's Maximum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The density value recorded when the maximum drive gain value for the current contract day occurred. Density units are determined based on the configuration of the meter.
69	Volume Rate at Today's Maximum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The volume rate recorded when the maximum drive gain value for the current contract day occurred. Volume units are determined based on the configuration of the meter.
70	Today's Minimum Drive Gain Cycle Start Time	R/O	System	UINT32	4	0-235959	0	1.00	The start time of the dump cycle in which the minimum drive gain value for the current contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
71	Today's Minimum Drive Gain Cycle End Time	R/O	System	UINT32	4	0-235959	0	1.00	The end time of the dump cycle in which the minimum drive gain value for the current contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
72	Today's Minimum Drive Gain Time of Occurrence	R/O	System	UINT32	4	0-235959	0	1.00	The time at which the minimum drive gain value for the current contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
73	Today's Minimum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The minimum drive gain value recorded during the current contract day. Drive gain units are percent.
74	Density at Today's Minimum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The density value recorded when the minimum drive gain value for the current contract day occurred. Density units are determined based on the configuration of the meter.
75	Volume Rate at Today's Minimum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The volume rate recorded when the minimum drive gain value for the current contract day occurred. Volume units are determined based on the configuration of the meter.
76	Yesterday's Maximum Drive Gain Cycle Start Time	R/O	System	UINT32	4	0-235959	0	1.00	The start time of the dump cycle in which the maximum drive gain value for the previous contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
77	Yesterday's Maximum Drive Gain Cycle End Time	R/O	System	UINT32	4	0-235959	0	1.00	The end time of the dump cycle in which the maximum drive gain value for the previous contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
78	Yesterday's Maximum Drive Gain Time of Occurrence	R/O	System	UINT32	4	0-235959	0	1.00	The time at which the maximum drive gain value for the previous contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
79	Yesterday's Maximum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The maximum drive gain value recorded during the previous contract day. Drive gain units are percent.
80	Yesterday's Average Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The average drive gain value during active dump cycles recorded during the previous contract day. Drive gain units are percent.
81	Density at Yesterday's Maximum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The density value recorded when the maximum drive gain value for the previous contract day occurred. Density units are determined based on the configuration of the meter.
82	Volume Rate at Yesterday's Maximum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The volume rate recorded when the maximum drive gain value for the previous contract day occurred. Volume units are determined based on the configuration of the meter.
83	Yesterday's Minimum Drive Gain Cycle Start Time	R/O	System	UINT32	4	0-235959	0	1.00	The start time of the dump cycle in which the minimum drive gain value for the previous contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
84	Yesterday's Minimum Drive Gain Cycle End Time	R/O	System	UINT32	4	0-235959	0	1.00	The end time of the dump cycle in which the minimum drive gain value for the previous contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
85	Yesterday's Minimum Drive Gain Time of Occurrence	R/O	System	UINT32	4	0-235959	0	1.00	The time at which the minimum drive gain value for the previous contract day was recorded. Byte 3 = Unused Byte 2 = Hours Byte 1 = Minutes Byte 0 = Seconds
86	Yesterday's Minimum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The minimum drive gain value recorded during the previous contract day. Drive gain units are percent.
87	Density at Yesterday's Minimum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The density value recorded when the minimum density value for the previous contract day occurred. Density units are determined based on the configuration of the meter.
88	Volume Rate at Yesterday's Minimum Drive Gain	R/O	System	FL	4	Any positive floating point number	0	1.00	The volume rate recorded when the minimum drive gain value for the previous contract day occurred. Volume units are determined based on the configuration of the meter.
89	Meter Zero	R/W	User and System	UINT8	1	0-1	0	1.00	Perform Meter Zero. The value of this parameter returns to 0 once the Start Meter process is complete. 0 = No action 1 = Start Meter Zero

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
90	Meter Zero Status	R/O	System	UINT8	1	0-4	0	1.00	Current status of the meter zero procedure. 0 = Complete 1 = In Progress 2 = Zeroing failed, zero too low 3 = Zeroing failed, zero too high 4 = Zeroing failed, zero too noisy
91	Previous Meter Zero Offset	R/O	System	FL	4	Any valid floating point number	0	1.00	The value of the meter zero offset previous to the last initiation of the Start Meter Zero cycle.
92	New Meter Zero Offset	R/O	System	FL	4	-5 to 5 uS	0	1.00	The value of the meter zero offset as determined by the meter zero procedure
93	Volume Flow Cutoff	R/W	System	FL	4	0 to High Volume Flow Limit of Sensor	0	1.00	The Volume Flow Cutoff currently being used by the meter.
94	Volume Flow Meter Factor	R/W	System	FL	4	0.8 - 1.2	0	1.00	The Volume Flow Meter Factor currently being used by the meter.
95	Mass Flow Meter Factor	R/W	System	FL	4	0.8 - 1.2	0	1.00	The Mass Flow Meter Factor currently being used by the meter.
96	Density Meter Factor	R/W	System	FL	4	Any positive floating point number	0	1.00	The Density Meter Factor currently being used by the meter.
97	Number of Requests Sent to Meter	R/O	System	UINT32	4	0-4294967295	0	1.00	The total number of Modbus requests sent to the Coriolis meter.
98	Number of Good Responses	R/O	System	UINT32	4	0-4294967295	0	1.00	The total number of valid Modbus responses received from the Coriolis meter.
99	Number of Response Timeouts	R/O	System	UINT32	4	0-4294967295	0	1.00	The total number of times a response was not received from the Coriolis meter.
100	Number of Error Responses	R/O	System	UINT32	4	0-4294967295	0	1.00	The total number of error Modbus responses received from the Coriolis meter.

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
101	Reset Communication Statistics	R/W	User and System	UINT8	1	0-1	0	1.00	Reset all communication statistics. The value of this parameter returns to 0 once the reset process is complete. 0 = Disabled 1 = Reset Stats.
102	Reset Totals	R/W	User and System	UINT8	1	0-1	0	1.00	Reset all totals -Current, Today, Yesterday, and Monthly- that are stored in the module. The Minimum and Maximum values are also reset. 0 = Disabled 1 = Reset Totals
103	Today's Total Accumulated Trickle Volume	R/O	System	FLOAT	4	Any positive floating point number	0	1.00	The total volume that the meter has recorded while not in a dump cycle for the current contract day
104	Today's Total Accumulated Trickle Mass	R/O	System	FLOAT	4	Any positive floating point number	0	1.00	The total mass that the meter has recorded while not in a dump cycle for the current contract day.
105	Yesterday's Total Accumulated Trickle Volume	R/O	System	FLOAT	4	Any positive floating point number	0	1.00	The total volume that the meter has recorded while not in a dump cycle for the previous contract day
106	Yesterday's Total Accumulated Trickle Mass	R/O	System	FLOAT	4	Any positive floating point number	0	1.00	The total mass that the meter has recorded while not in a dump cycle for the previous contract day.
107	Current Volume Total	R/O	System	FLOAT	4	Any positive floating point number	0	1.00	Volume total based on the volume total read from the double precision accumulator in the Coriolis meter.
108	Previous Volume Total	R/O	System	FLOAT	4	Any positive floating point number	0	1.00	Previous volume total based on the volume total read from the double precision accumulator in the Coriolis meter during the previous second.
109	Current Mass Total	R/O	System	FLOAT	4	Any positive floating point number	0	1.00	Mass total based on the mass total read from the double precision accumulator in the Coriolis meter.
110	Previous Mass Total	R/O	System	FLOAT	4	Any positive floating point number	0	1.00	Previous mass total based on the mass total read from the double precision accumulator in the Coriolis meter during the previous second.

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
111	Licensed Features	R/O	System	UINT8	1	0-3	0	1.10	Indicates the licensed features. Valid values are: 0 = SMV License 1 = PVR License 2 = TBR License 3 = TMR License
112	SMV Start	R/W	User and System	UINT8	2	0-2	0	1.00	Sends the SMV Start Mode to the meter to begin the SMV process, or aborts the process if it is already started 0 = No Action 1 = Start SMV by sending the SMV Start Mode to the meter, or send a 0 to the meter to abort the SMV process 2 = Start or Abort in progress.
113	Flow Type	R/W	User and System	UINT8	1	0-1	0	1.00	Defines how the module handles flow: 0 = Continuous Flow Mode 1 = Dump Cycle Flow Mode
114	TBR Enable/Disable	R/W	System	UINT8	1	0 or 1	0	1.00	Indicates if the TBR (Transient Bubble Remediation) capabilities of the meter have been enabled or disabled. 0 = TBR Disabled 1 = TBR Enabled
115	Current Pressure Compensation Effect On Flow	R/O	System	FLOAT	4	Any positive floating point number	0.0	1.00	Current pressure compensation effect on flow. This value is not populated when a transmitter is used.
116	Current Pressure Compensation Effect On Density	R/O	System	FLOAT	4	Any positive floating point number	0.0	1.00	Current pressure compensation effect on density. This value is not populated when a transmitter is used.
117	Duration of Last TBR	R/O	System	FLOAT	4	Any positive floating point number	0.0	1.00	Amount of time (in seconds) TBR was active the last time it was executed
118	Zero Standard Deviation	R/O	System	FLOAT	4	Any floating point number	0.0	1.00	Zero Standard Deviation
119	Left pickoff voltage (volts)	R/O	System	FLOAT	4	Any floating point number	0.0	1.00	Left pickoff voltage (volts)
120	Right pickoff voltage (volts)	R/O	System	FLOAT	4	Any floating point number	0.0	1.00	Right pickoff voltage (volts)

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
121	Live zero (mass flow)	R/O	System	FLOAT	4	Any floating point number	0.0	1.00	Live zero (mass flow)
122	SMV Start Mode	R/W	User and System	UINT16	2	1, 6	1	1.00	Value sent to Meter to initiate the Smart Meter Verification Process: 1 = Start with Output Fixed 6 = Start with Continuous Values
123	SMV State	R/O	System	UINT16	2	0-255	0	1.00	Smart Meter Verification State: 0 = Not Running >0 = Running
124	SMV Abort Code	R/O	System	UINT16	2	0-15	0	1.00	Abort (Error) Code for the previous SMV Procedure. Valid values are: 0 = No Error 1 = User Initiated Abort 2 = Drive Settle Time error 3 = Frequency Drift 4 = Drive voltage too high 5 = Drive current too high (unstable drive) 6 = Drive current erratic (unstable drive) 7 = General drive error 8 = Delta T erratic 9 = Delta T too high 10 = State running 11 = State complete 12 =Meter verification data error 13 = Unit has not been calibrated on air 14 = Unit has not been calibrated on water 15 = Meter verification configuration items are not correct
125	SMV State at Abort	R/O	System	UINT16	2	0-255	0	1.00	Smart Meter Verification State When Abort Occurred: 16 = SMV Completed 0-15 = SMV Aborted before completion
126	SMV Inlet Stiffness	R/O	System	UINT16	2	0-65535	0	1.00	Smart Meter Verification Inlet Stiffness: 0 = In Limits >0 = Out of Limits

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
127	SMV Outlet Stiffness	R/O	System	UINT16	2	0-65535	0	1.00	Smart Meter Verification Outlet Stiffness: 0 = In Limits >0 = Out of Limits
128	Meter Model Type	R/O	System	UINT8	1	0-1	0	1.00	Sensor Type 0 = Curved Tube 1 = Straight Tube
129	SMV Percent Complete	R/O	System	UINT16	2	0-100	0	1.00	Percentage of the current SMV procedure that is complete.
130	Raw tube frequency (Hz)	R/O	System	FLOAT	4	Any floating point number	0.0	1.00	Raw tube frequency (Hz)
131	LPO amplitude (volts)	R/O	System	FLOAT	4	Any floating point number	0.0	1.00	LPO amplitude (volts)
132	RPO amplitude (volts)	R/O	System	FLOAT	4	Any floating point number	0.0	1.00	RPO amplitude (volts)
133	Board temperature (°C)	R/O	System	FLOAT	4	Any floating point number	0.0	1.00	Board temperature (°C)
134	Input voltage (volts)	R/O	System	FLOAT	4	Any floating point number	0.0	1.00	Input voltage (volts)
135	TBR status	R/O	System	UINT8	1	0 or 1	0	1.00	Set by METER (if TBR option is activated) to indicate current status.
136	Status Word 1	R/O	System	UINT16	2	0-65535	0	1.00	Status Word 1: Bit 0 = Core EEPROM Checksum Error Bit 1 = Core RAM Test Error Bit 2 = Real-Time Interrup Failure Bit 3 = Sensor Failure Bit 4 = Temperature Sensor Out-of-Range Bit 5 = Calibration Failure Bit 6 = Other Failure Bit 7 = Transmitter Initializing/Warming Up Bit 8 = PV Out-of-Limits Bit 9 = Non-PV Out-of-Limits Bit 10 = Simulation Mode Active Bit 11 = Undefined Bit 12 = Watchdog Error Bit 13 = Cold Start Bit 14 = Transmitter Configuration Changed Bit 15 = Fault

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
137	Status Word 2	R/O	System	UINT16	2	0-65535	0	1.00	Status Word 2: Bit 0 = Primary mA Output Saturated Bit 1 = Secondary mA Output Saturated Bit 2 = Primary mA Output Fixed Bit 3 = Secondary mA Output Fixed Bit 4 = Density Outside Limits Bit 5 = Drive Over-Range Bit 6 = PIC/Daughterboard Communication Failure Bit 7 = External Input Failure Bit 8 = Core EEPROM Checksum Error Bit 9 = Core RAM Error Bit 10 = Sensor Not Responding Bit 11 = Temperature Sensor Out-of-Range Bit 12 = Input Over-Range Bit 13 = Frequency Output Saturated Bit 14 = Transmitter Not Characterized Bit 15 = Real-Time Interrupt Failure

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
138	Status Word 3	R/O	System	UINT16	2	0-65535	0	1.00	Status Word 3: Bit 0 = Burst Mode Enabled Bit 1 = Power Reset Occurred Bit 2 = Transmitter Initializing/Warming Up Bit 3 = Sensor/Xmtr Communication Failure Bit 4 = Paper Out Bit 5 = Event #2 Triggered Bit 6 = Event #1 Triggered Bit 7 = Sensor/Xmtr Communication Failure Bit 8 = Calibration Failure Bit 9 = Excess Calibration Correction, Auto Zero too Low Bit 10 = Excess Calibration Correct, Autozero too High Bit 11 = Process too Noisy to Perform Auto Zero Bit 12 = Transmitter Failed Bit 13 = Data Loss Possible Bit 14 = Calibration-In-Progress Bit 15 = Slug flow

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
139	Status Word 4	R/O	System	UINT16	2	0-65535	0	1.00	Status Word 4: Bit 0 = API.VCF: Temperature Outside Standard Bit 1 = API.VCF: Line Density Outside Standard Range Bit 2 = Line RTD Temperature Out-of-Range Bit 3 = Case/Meter RTD Temperature Out-of-Range Bit 4 = Flow Direction (0 = Forward/1 = Reverse) Bit 5 = Factory Configuration Data is Invalid Bit 6 = Enhanced Density: Unable to fit curve data Bit 7 = Last Measured Value Override Active Bit 8 = Enhanced Density Extrapolation Alarm Bit 9 = Cal Factors Unentered Bit 10 = 1000/2000/3000 EEPROM Checksum Error Bit 11 = 1000/2000/3000 RAM Test Error Bit 12 = Unrecognized/Unenterd Sensor Type Bit 13 = Core Configuration Database Corrupt Bit 14 = Core Power Down Totals Corrupt Bit 15 = Core Program Corrupt
140	SMV Output State	R/W	User and System	UINT16	2	0-1	0	1.00	Smart Meter Verification Output State during procedure: 0 = Last Value 1 = Fault Value
141	TBR Timeout (seconds)	R/W	User and System	UNIT16	2	0-30,000	0	1.00	For **TBR**, the amount of time, in seconds that the last measured value will be held after a bubble is first detected.
	TMR Pre-Mist Average Period (seconds)	R/W	User and System	UNIT16	2	0-30,000	0	1.00	For **TMR**, the amount of time, in seconds, for the pre-mist period.

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
142	TBR LMV Sample Position	R/W	User and System	UNIT16	2	5 to 30	0	1.00	For **TBR**, the number of seconds back in time to calculate density LMV.
	TMR Post-Mist Adjust Delay	R/W	User and System	UNIT16	2	5 to 30	0	1.00	For **TMR**, the number of seconds the post-mist is delayed.
143	TBR Control	R/W	User and System	UINT8	4	0-127	0	1.00	TBR Control Bit 0: Initial Action 0 = Hold Last Value 1 = Set TBR Active Status Only Bit 1: Timeout Action 0 = Show Actual Values 1 = Alarm Bit 2: Drive Averaging 0 = 1 Second 1 = 4 Seconds Bit 3: Affects flow 0 = Yes 1 = No Bit 4: Affects Density 0 = Yes 1 = No Bit 5: Timeout Alarm Type 0 = Slug Flow 1 = Density OOL Bit 6: Timeout 0 = Disabled 1 = Enabled
144	SMV Stiffness Setpoint	R/W	User and System	FLOAT	4	Any floating point value	0.0025 – 0.4	1.00	Smart Meter Verification Stiffness Setpoint
145	TBR Drive Gain Threshold	R/W	User and System	FLOAT	4	Any positive floating point number	0	1.00	For **TBR**, the Drive Gain percentage above which TBR triggers.
	TMR Drive Gain Threshold	R/W	User and System	FLOAT	4	Any positive floating point number	0	1.00	For **TMR**, the Drive Gain percentage above which TMR triggers.
146	Flow Damping	R/W	User and System	FLOAT	4	0-60 seconds	0.0	1.00	Flow rate internal damping (seconds)
147	Mass Flow Cutoff	R/W	User and System	FLOAT	4	0 to High Mass Flow Limit of Sensor	0.0	1.00	Mass Flow Cutoff
148	Density Calibration Point 1 (D1)	R/W	User and System	FLOAT	4	0 – 5 g/cc	0.0	1.00	Density Calibration Point 1 (D1)

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
149	Density Calibration Point 2 (D2)	R/W	User and System	FLOAT	4	0 – 5 g/cc	0.0	1.00	Density Calibration Point 2 (D2)
150	Tube Period @ D1 (K1)	R/W	User and System	FLOAT	4	1000 - 50000	0.0	1.00	Tube Period @ D1 (K1)
151	Tube Period @ D2 (K2)	R/W	User and System	FLOAT	4	1000 - 50000	0.0	1.00	Tube Period @ D2 (K2)
152	Density Temperature Correction (DT)	R/W	User and System	FLOAT	4	-20 to 20	0.0	1.00	Density Temperature Correction (DT)
153	Density Flow Correction (FD)	R/W	User and System	FLOAT	4	Any positive floating point number	0.0	1.00	Density Flow Correction (FD)
154	Slug Flow High Density Limit (g/cc)	R/W	User and System	FLOAT	4	0 – 5 g/cc	0.0	1.00	Slug Flow High Density Limit (g/cc)
155	Slug Flow Low Density Limit (g/cc)	R/W	User and System	FLOAT	4	0 – 5 g/cc	0.0	1.00	Slug Flow Low Density Limit (g/cc)
156	Sensor High Mass Flow Limit	R/W	System	FLOAT	4	Any positive floating point number	0	1.00	The maximum Mass flow rate that the sensor can detect.
157	Sensor High Volume Flow Limit	R/W	System	FLOAT	4	Any positive floating point number	0	1.00	The maximum volume flow rate that the sensor can detect.
158	Device Type	R/O	System	UINT16	2	0-65535	0	1.00	Identifies the type of device attached to the module. Valid values are: 40 = 700 Core Processor 50 = 800 Enhanced Core Processor 36 = 1500 Transmitter 37 = 2500 Transmitter 41 = 1700 Transmitter 42 = 2700 Transmitter 65 = 3000 series transmitter
159	Manufacturer ID	R/O	System	UINT16	2	0-65535	0	1.00	Manufacturer ID
160	External temperature input value	R/W	User and System	FLOAT	4	-240 to 450 C	0.0	1.00	External temperature input value
161	External pressure input value	R/W	User and System	FLOAT	4	-1.5 to 10000 BAR	0.0	1.00	External pressure input value
162	Pressure correction factor for flow	R/W	User and System	FLOAT	4	-0.1 to 0.1	0.0	1.00	Pressure correction factor for mass flow
163	Pressure correction factor for density	R/W	User and System	FLOAT	4	-0.1 to 0.1	0.0	1.00	Pressure correction factor for density

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
164	Flow Calibration Pressure	R/W	User and System	FLOAT	4	Any positive floating point number	0.0	1.00	Flow calibration pressure
165	LD Optimization	R/W	User and System	UINT16	1	0-1	0	1.00	LD Optimization for liquid hydrocarbons. Should not be enabled for gas measurement. 0 = Disabled 1 = Enabled
166	Flow Direction Setup	R/W	User and System	UINT8	4	0-5	0	1.00	The flow direction configured for the meter. 0 = Forward Only 1 = Reverse Only 2 = Bi-Directional 3 = Absolute Value 4 = Negate/Forward Only 5 = Negate/Bi-Directional

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
167	Pressure Units	R/W	User and System	UINT16	1	0-239	0	1.00	Pressure Units. Valid values are 0 = Unknown 1 = Inches water @ 68 degrees Fahrenheit 2 = Inches mercury @ 0 degrees Celsius 3 = Feet water @ 68 degrees Fahrenheit 4 = Millimeters water @ 68 degrees Fahrenheit 5 = Millimeters mercury @ 0 degrees Celsius 6 = Pounds/square inch 7 = Bar 8 = Millibar 9 = Grams/square centimeter 10 = Kilograms/square centimeter 11 = Pascals 12 = Kilopascals 13 = Torr @ 0 degrees Celsius 14 = Atmospheres 145 = Inches water @ 60 degrees Fahrenheit 237 = Megapascals 238 = Inches water @ 4 degrees Celsius 239 = Millimeters water @ 4 degrees Celsius
168	Flow Calibration Factor (FCF)	R/W	User and System	AC	20	ASCII	“”	1.00	Flow Calibration Factor (FCF)
169	Temperature Calibration Factor	R/W	User and System	AC	20	ASCII	“”	1.00	Temperature Calibration Factor
170	Volume Accumulated	R/O	System	FLOAT	4	Any positive floating point number	0.0	1.00	Amount of volume accumulated by the module. This accumulator rolls over at 1,000,000.0

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
171	Mass Accumulated	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.00	Amount of mass accumulated by the module. This accumulator rolls over at 1,000,000.0
172	Flow Direction Calculated	R/W	System	UNIT8	1	0-1	0	1.00	The flow direction, as read from the meter. 0 = Forward (Direct) 1 = Reverse
173	Rev Volume Today	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.00	The volume accumulated in the current contract day. Volume units are determined based on the configuration of the meter.
174	Rev Volume Yesterday	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.00	The volume accumulated in the previous contract day. Volume units are determined based on the configuration of the meter.
175	Rev Volume Monthly	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.00	The volume accumulated in the previous month. Volume units are determined based on the configuration of the meter.
176	Rev Volume Accumulated	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.00	Amount of reverse volume accumulated by the module. This accumulator rolls over at 1,000,000.0
177	Rev Mass Today	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.00	The mass accumulated in the current contract day. Mass units are determined based on the configuration of the meter.
178	Rev Mass Yesterday	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.00	The mass accumulated in the previous contract day. Mass units are determined based on the configuration of the meter.
179	Rev Mass Monthly	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.00	The mass accumulated in the previous month. Mass Total units are determined based on the configuration of the meter.
180	Rev Mass Accumulated	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.00	Amount of reverse mass accumulated by the module. This accumulator rolls over at 1,000,000.0

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
181	Volume Flow Rate Reverse	R/O	System	FLOAT	4	Any positive floating point number	0.0	1.00	Current Reverse Volume Flow Rate retrieved from the meter. Volume Rate units are determined based on the configuration of the meter.
182	Mass Flow Rate Reverse	R/O	System	FLOAT	4	Any positive floating point number	0.0	1.00	Current Reverse Mass Flow Rate retrieved from the meter. Mass Rate units are determined based on the configuration of the meter.
183	Mass Den Correction for Pressure	R/W	User	UNIT8	1	0-1	0	1.00	Enables/disables the meter correction for the effect of pressure on the mass flow and density. This feature requires the external pressure (parameter 161) to be populated, as well as the pressure correction factors (parameters 162 and 163). 0 = Disabled 1 = Enabled
184	Water Cut Uncorrected	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The value of the calculated water cut of the oil/water mixture at line (flowing) conditions.
185	Water Cut Corrected	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The value of the calculated water cut of the oil/water mixture at reference (base) conditions.
186	Net Water Flow Uncorrected	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The volume flowrate of the water at line (flowing) conditions.
187	Net Water Flow Corrected	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The volume flowrate of the water at reference (base) conditions.
188	Net Oil Flow Uncorrected	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The volume flowrate of the oil at line (flowing) conditions.
189	Net Oil Flow Corrected	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The volume flowrate of the oil at reference (base) conditions.
190	Net Water Total Uncorrected	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The volume accumulation of the water at line (flowing) conditions.
191	Net Water Total Corrected	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The volume accumulation of the water at reference (base) conditions.

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
192	Net Oil Total Uncorrected	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The volume accumulation of the oil at line (flowing) conditions.
193	Net Oil Total Correcte	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The volume accumulation of the oil at reference (base) conditions.
194	Mix Mass Total Unremediated	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The mass accumulation of the oil/water mixture as directly measured by the meter.
195	Mass Flowrate Remediated	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The mass flowrate of the oil/water mixture remediated for any transient bubbles.
196	Mass Total Remediated	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The mass accumulation of the oil/water mixture remediated for any transient bubbles..
197	Volume Total Remediated	R/W	System	FLOAT	4	Any positive floating point number	0.0	1.10	The combined oil and water volume total remediated for any transient bubbles.
198	Reference Temp	R/W	User	FLOAT	4	Any positive floating point number	0.0	1.10	The temperature at which the “corrected” flowrates and totals have been corrected. This is typically 60 deg F or 15 deg C. The units are determined by the associated temperature unit selected (parameter 14).
199	Oil Base Density	R/W	User	FLOAT	4	Any positive floating point number	0.0	1.10	The density of “dry” oil at base conditions. This is used to calculate the water cut and therefore determine the percentage of oil versus water in the stream. This value is obtained by use of a petroleum analysis laboratory or an external calculation routine. The units expected for the value are determined by the associated density unit selection (parameter 16).

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Parm #	Name	Access	System or User Update	Data Type	Length	Range	Default	Version	Description of functionality and meaning of values
200	Water Base Density	R/W	User	FLOAT	4	Any positive floating point number	0.0	1.10	The density of produced water at base conditions. This is used to calculate the water cut and therefore determine the percentage of oil versus water in the stream. This value is obtained by use of a petroleum analysis laboratory or an external calculation routine. The units expected for the value are determined by the associated density unit selection (parameter 16).

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